VOL. LXXIX PART SEVEN

JOURNAL OF THE ROYAL HORTICULTURAL SOCIETY

JULY 1954

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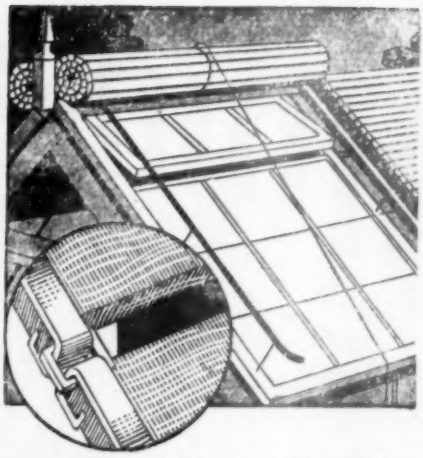

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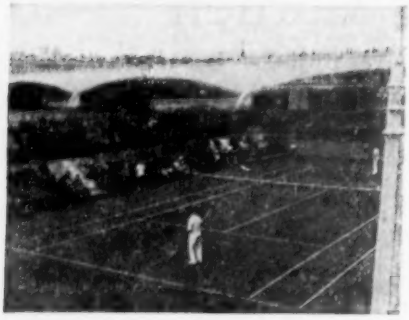

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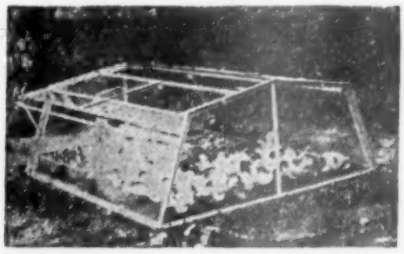

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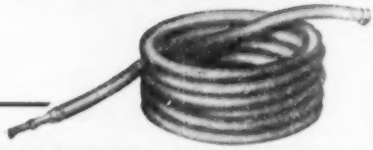

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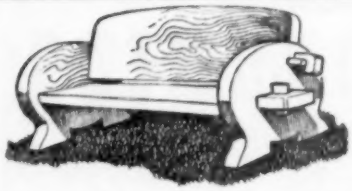

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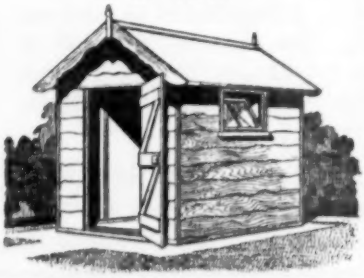

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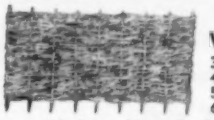

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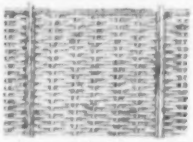

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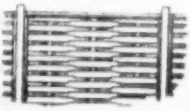

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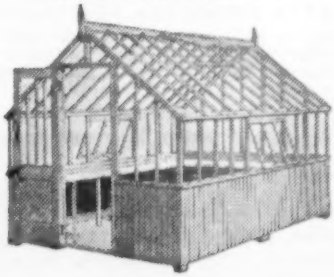

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with the assistance of members of the staff of the Royal Botanic Garden, Edinburgh, and E. H. M. Cox

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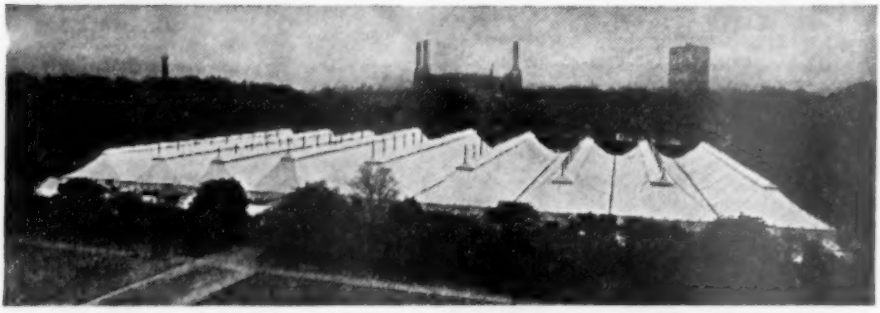

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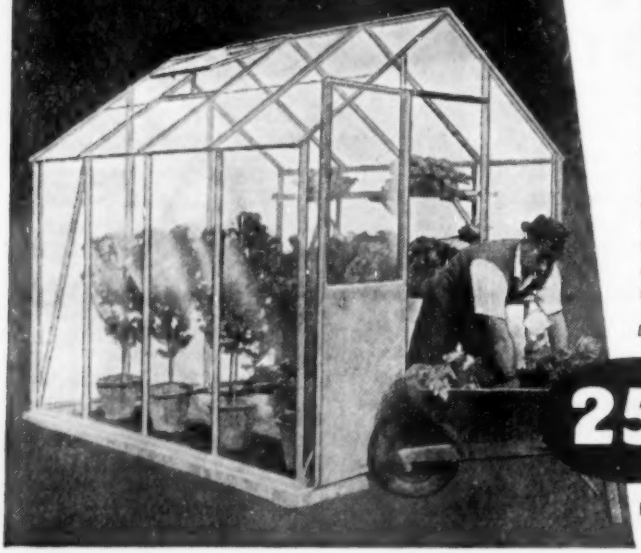

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JOURNAL OF THE ROYAL HORTICULTURAL SOCIETY

VOL. LXXIX PART SEVEN

July 1954

THE SECRETARY'S PAGE

ANNOUNCEMENTS—JULY AND AUGUST

Shows

FRIDAY, July 2 11 A.M. to 7 P.M. SATURDAY, July 3 10 A.M. to 5 P.M.	National Rose Society's Show.
TUESDAY, July 6 12 NOON to 6 P.M.	Floral Arrangement Competition for Amateurs.
TUESDAY, July 6 12 NOON to 7 P.M.	National Sweet Pea Society's Show.
TUESDAY, July 13 12.30 P.M. to 6 P.M. WEDNESDAY, July 14 10 A.M. to 5 P.M.	Fortnightly Show. Fruit and Vegetable Competition.
TUESDAY, July 13 12 NOON to 7 P.M. WEDNESDAY, July 14 10 A.M. to 5 P.M.	British National Carnation Society's Show.
TUESDAY, July 27 12 NOON to 6 P.M. WEDNESDAY, July 28 10 A.M. to 5 P.M.	Fortnightly Show.
WEDNESDAY, July 28 THURSDAY, July 29 FRIDAY, July 30 10 A.M. to 5 P.M. daily	Exhibition of historical documents, rare books, congratulatory addresses, etc., in the possession of the Society.
TUESDAY, August 10 12 NOON to 6 P.M. WEDNESDAY, August 11 10 A.M. to 5 P.M.	Fortnightly Show. Gladiolus Competition. British Fuchsia Society's Competition.

Shows—*continued*

TUESDAY, August 24
12 NOON to 6 P.M.
WEDNESDAY, August 25
10 A.M. to 5 P.M.
} Fortnightly Show.

Lectures

TUESDAY, July 13, at 3 P.M. "Fruits for the Connoisseur" by MR. J. M. S. POTTER, N.D.H.

TUESDAY, July 27, at 3 P.M. "The History of The Royal Horticultural Society" by MR. A. SIMMONDS, M.C., V.M.H. and "The Royal Horticultural Society's Gardens, Wisley" by DR. H. R. FLETCHER. Admission to the lectures will be by special ticket only. It is regretted that no further tickets are available.

TUESDAY, August 10, at 3 P.M. Masters Memorial Lecture, "The History of Garden Roses, Part I" by MISS A. WYLIE, M.SC.

Demonstrations—The following demonstration will be given at Wisley, that on the second and third days being a repetition of that given on the first.

Flower Garden—July 21–22–23. The Vegetative Propagation of Shrubs and Herbaceous Plants. (Commencing at 2 P.M.)

The Closing of Wisley Gardens on July 28—Attention is drawn to the fact that the Gardens will be closed on July 28 except to holders of special tickets who are attending the Sesquicentennial functions there and the opening of the new Hostel. It is regretted that no further applications for tickets for these functions can be entertained.

Wisley Trials—The Royal Horticultural Society will start a permanent trial of Herbaceous Paeonies in the autumn of 1954 and invites entries for this trial.

Conditions for entry to the trial—1. All entries must be made on the appropriate form obtainable from The Director, The Royal Horticultural Society's Gardens, Wisley, Ripley, Woking, Surrey.

2. The entrant must certify on the form either (a) that the variety has been raised or developed by him, or (b) that the variety was or is about to be, introduced by him to British commerce.

3. Entry forms must be completed and returned to the Director at Wisley not later than July 31, 1954.

4. One plant of each variety accepted for the trial will be required for planting in the autumn of 1954. The entrant should not send plants until he is notified that his entries have been accepted.

NOTES FROM WISLEY

J. B. Paton

THE successful cultivation of Lilies has always been a splendid feature of Wisley, for MR. G. F. WILSON had grown them with great success for thirty years before the Society took over the Garden in 1940.

Today in the Wild Garden there is one planting of *Lilium rubellum* which has been in the same position for over forty years, while the Himalayan *L. giganteum*, as in MR. WILSON's day, still flourishes under the shade of the trees lifting its glorious waxen trumpets on bold stems 8 feet or more high.

When the Society forsook its Chiswick Garden in 1904 MR. E. H. WILSON was in Western Szechwan and in that year sent home 300 bulbs of *L. regale* which he had seen flowering in a small strip of the semi-arid valley of the River Min. It is to this species that the present popularity of the genus owes much, for with the introduction of this easily cultivated Lily, so readily raised from seed, many people have been induced to grow other species. The Regal Lily bulb, which is yellow-brown or orange coloured on lifting and changes to wine-red on exposure to the light, should be planted 8–10 inches deep; from it grows a sturdy stem clothed with dark lustrous green leaves which provide a good setting for the fragrant funnel-shaped blooms which open in July. These flowers, up to thirty on a stem, are rose-purple without, white within and sulphur-yellow at the throat. From Hupeh and Szechwan, the closely related *L. leucanthum* with milk-white flowers on a 4-foot stem, is not such an easy doer; as those who have succeeded with it have stated that it appreciates very sharp drainage it should be more suited to cultivation on the slopes of Battleston Hill than in the more stagnant soil moisture of the Wild Garden. Its variety *centifolium*, introduced by REGINALD FARRER in 1914 from Southern Kansu, is a more robust plant making growths of 9–10 feet on which are carried an abundance of dark green leaves. The large fragrant trumpet-shaped flowers are white on the inside passing to pale yellow at the throat and with a flush of green and purple on the outside. *L. Davidii* is named after the celebrated French missionary and naturalist who collected in 1869 and sent home to the Paris Museum a dried specimen from Western Szechwan. But it was to WILSON that we owe the introduction to cultivation in 1904 of this stem-rooting Lily which is best planted 6–8 inches deep in leaf mould in a site open to the full sun and which does not object to a little lime in the soil. It bears in July up to twenty nodding orange, black-spotted, Turk's-cap-shaped, flowers. As in nature this species is very variable so in gardens there are many forms or varieties of it and at Wisley there may be seen *L. Davidii* var. *Willmottiae* with flowers similar to those of the type although of less intense a colour and borne with such profusion that the stem usually arches over unless supported, and the variety *unicolor* with the robust habit of *L. Davidii* but either without the spotting on the flower segments or with the spotting much less conspicuous.

L. tigrinum, which is found all over China, Japan and Korea where it has been used for over a thousand years as food, is regarded by E. H. WILSON as a native of Eastern China. First received at Kew in 1804, the date of the Society's foundation, AITKEN of Kew during the next eight years propagated and distributed over 10,000 bulbs. Flowering rather late in the season it is at its best in August when the fire-red,

recurved and papillate segments are seen to be purple-black-spotted. The bulbils, so frequently developed in the axils of the leaves, will produce flowering-sized plants in two or three years. This Lily unfortunately has proved very susceptible to virus disease and although this does not appear to affect its flowering it does act as a source of infection for its less robust neighbours, to which the virus may be carried by aphids. Likewise readily propagated by bulbils is the trumpet-flowered *L. sulphureum*, also known as *L. myriophyllum*, from China and Burma. The commonly grown Burmese form ***superbum*** is coloured deep yellow in the throat with the upper part of the segments pure white and the outside pink-flushed. It is a stem rooter and should be planted 8–10 inches deep as should yet another stem-rooting species *L. Henryi* with recurved and papillate dark-spotted orange flower segments. It was introduced from Central China by PROFESSOR AUGUSTINE HENRY in 1889.

Of the Japanese Lilies *L. rubellum* from the island of Honshu is also a stem-rooting species which appreciates plenty of leaf-mould and carries delicate rose-pink flowers in late May or June. *L. auratum*, the Golden Rayed Lily of Japan, is acclaimed as the Queen of Lilies. It was introduced to British Gardens in 1862 by J. G. VEITCH who showed it to the Society in that year. Up to thirty-five large flowers may be carried on each stem and they open over an extended period from August to September. The large bowl-shaped blooms are waxy white, golden streaked and crimson-spotted. In the Wild Garden at Wisley there is to be seen the 'Esperanza' strain of this Lily which was raised by MESSRS. BUCKLEY in British Columbia. This strain will also make a fine show in pots as those who visited MR. BENTLEY'S garden near Newbury may remember. From Southern Japan *L. speciosum*, introduced in 1830, rivals *L. auratum* for splendour of flower and even the specific name, which means 'good-looking,' advertises the beauty of its white deep pink-suffused flowers. Alas, flowering late in the season, it can be grown outdoors satisfactorily only in the south. In the Wild Garden is to be found the variety ***magnificum*** with rose-pink, crimson-spotted flowers, and one of the finest of the ***speciosum*** forms available.

From Korea *L. Hansonii* is a well-known easily grown Lily, having been in cultivation in Europe for over seventy years. It has numerous whorls of lustrous green leaves while the flowers are composed of extraordinarily thick orange-yellow segments which spread and recurve as they open. Another Korean (though coming also from Japan) *L. Leichtlinii* var. ***Maximowiczii*** with red flowers, is also fairly easy to grow although the same cannot be said of the yellow-flowered *L. Leichtlinii*.

A native of Europe and Western Asia *L. Martagon* is neither difficult nor particularly attractive and where other Lilies may be grown it can be omitted. But its white variety is a fine plant which adorns the Fernery in the Wild Garden. The pure white unspotted flowers show up well against the dark foliage and the green stem, and provided no other *Martagon* is in the vicinity it will come reasonably true from seed. From the Northern Caucasus come two species, *L. monadelphum* and

L. Szovitsianum; these are both to be seen in the Wild Garden. *L. Szovitsianum*, sometimes thought to be only a variety of *L. monadelphum*, is best regarded as a distinct species. The differences are that *L. monadelphum* has filaments which usually are united while those of *L. Szovitsianum* are always free. The pollen of the former is yellow like the perianth while the latter's pollen is reddish-brown in contrast to its yellow flower. Their areas of distribution are also different and do not overlap anywhere, *L. monadelphum* being found to the north of its ally. Both appreciate cool positions on the edges of woods or among shrubs where they can grow up to 6 feet high.

Of European Lilies *L. pyrenaicum*, as its name implies, hails from the Pyrenees where it is found on both the French and Spanish sides of the mountain range. It is a very hardy, early, greenish-yellow Lily which thrives in all soils and is even found naturalized on hedge banks in Inverness-shire and in Devon. *L. bulbiferum* and its variety *croceum* have had many changes in name but still remain valuable garden plants. The type has tawny-chestnut-red flower segments which have an orange patch and the variety *croceum* has large upstanding cup-shaped flowers of orange-yellow turning reddish at the tips and freely marked with dark spots in the throat.

Of American Lilies *L. canadense* was the first to be introduced to this country and possibly still is the easiest American to grow. It always should be planted in autumn at a depth of 6–10 inches. The flowers are composed of deep yellow or orange segments which flare out widely and curve gracefully backward at their tips. The leaves are arranged in whorls as are those of *L. superbum*, the American Turk's-cap, which is variable in colour but usually is orange changing to crimson at the tips of the well recurved segments. Equally variable in colour are the crimson to bright orange-red or even yellow recurved petals of the Californian *L. pardalinum*.

Finally consideration must be given to some Lily hybrids and without doubt the finest sight at Wisley in early July is the planting of Bellingham hybrid Lilies in the Rhododendron species collection at the top of Battleston Hill. These Lilies, in shades of orange and yellow, arose from crossing *L. pardalinum*, *L. Humboldtii* and *L. Parryi*. The original hybridization was done by MR. LUTHER BURBANK and his work has been continued by MR. JAN DE GRAAFF at the Oregon Bulb Farm. To MR. DE GRAAFF'S generosity we owe the original bulbs of many of the newer American hybrids at Wisley. Without exception the Bellingham hybrids are of very great vigour and are first-class garden plants growing 7–8 feet or more high and carrying a large pyramid of up to forty flowers. The yellow 'Shuksan' though of a finer colour than most of the others appears to be of rather less vigour.

From the same source are the Fiesta hybrids in dark and light shades, the former the result of crossing *L. Davidii* with *L. amabile* and the latter of crossing *L. Davidii* with *L. amabile luteum*. Of the Oregon Farm's Mid Century hybrids there are on Battleston Hill the clones *L.*

'Enchantment,' *L.* 'Vagabond' and *L.* 'Fire-flame.' These are the result of hybridization between *L.* × *hollandicum* and *L. tigrinum splendens*.

Of the hybrids of which *L. Martagon* is a parent there are *L.* 'Brocade,' raised at Oregon, in which the white *Martagon* has been crossed with *L. Hansonii*, *L.* 'Marhan' with the same parentage which originated at Messrs. van Tubergen's Nurseries at Haarlem in 1886 and *L.* × *dalhansoni* in which the Dalmatian form of *L. Martagon* was crossed with *L. Hansonii*.

The hybrids between *L. bulbiferum* and *L.* × *macalatum* are known either as *L.* × *hollandicum* or more commonly as *L.* × *umbellatum* and are fine plants for the more open position where they make a bold display with their upstanding bright orange or yellow flowers. The bright orange form 'Incomparable' to be seen in the Award of Garden Merit Collection, and 'Golden Fleece' with yellow blooms are two clones which have been vegetatively propagated. Other hybrids which should bloom well this year include *LL.* × *centigale*, × *Will-crovidii*, 'Maxwill,' 'Waxwing,' 'Radiance,' 'Azalia,' 'Stooke's Hybrid,' 'Golden Clarion.'

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VICE-PRESIDENT OF

THE ROYAL HORTICULTURAL SOCIETY

VICE-CHAIRMAN OF THE COUNCIL

ON May 7, 1954, MR. EDWARD AUGUSTUS BOWLES died at Myddelton House, Enfield, full of years as the world reckons, but still so young in spirit that his passing will leave a sad gap in the lives of all who knew him. Had he survived for another week he would have entered his 90th year.

He was awarded the V.M.H., the highest honour it is in the power of the Society to bestow, as long ago as 1916; making him at the time of his death by seven years the senior holder of this distinction.

He was nearly the last of a generation of great gardeners which included the late LORD ABERCONWAY, SIR EDMUND LODER and his brother LORD WAKEHURST, MR. H. J. ELWES, MR. REGINALD FARRER, MESSRS. J. C. and P. D. WILLIAMS and many others of equal fame, and in some ways he was the greatest of them all. His interest in plants embraced not only all plants from the humblest weed to the most sophisticated Orchid—with something of a bias in favour of the weed—but everything connected with Botany as a living science. He would always put great emphasis on the word "living"; with herbarium specimens he was inclined to be impatient—"mummies" he called them.

Those who have read his delightful books on *My Garden in Spring*, *Summer* and *Autumn* will remember that he came of French Huguenot

stock, and that his family were connected with the "New River" of which a loop, subsequently by-passed by the Metropolitan Water Board, flowed through the gardens of Myddelton House. He was brought up and educated with a view to taking orders in the Church of England, and, although the onset of severe attacks of asthma frustrated this intention, he remained a duly licensed lay reader, and to the end of his long life took part of the duty at his parish church. It was these severe attacks of asthma that first drove him to the high Alps and started him on the annual exiles in late spring from which he never returned without a heavy cargo of plants which he had himself collected in the wild, and which were duly ensconced in the garden at Myddelton House, from whence they have been carried far and wide by all those friends, and even strangers, who visited his garden, and to whom his habitual greeting was "I hope you've brought a basket with you." In middle age these attacks of asthma diminished in severity and finally ceased altogether.

BOWLES's first enthusiasm was entomology. He was a bug hunter before he was a gardener and in his early years he formed an outstanding collection of British lepidoptera. He never lost his passionate interest in insects of all sorts and in later life was particularly interested in their inter-relationships with the plant world, either as predators or matrimonial agents; and to BOWLES was due much of the encouragement that was given to the late MR. FOX WILSON in the researches which he undertook at Wisley.

BOWLES always used to say that it was CANON ELLACOMBE who had first aroused his enthusiasm for gardening. The garden at Bitton he maintained was the most interesting garden he had ever seen, and many of the more uncommon plants at Myddelton House came originally from that garden. For all his learning and astounding knowledge, BOWLES was first and foremost a gardener and not a scientist. He had all the artist's delight in form and colour. Those who have seen the garden at Myddelton House when *Crocus speciosus* and *Cyclamen neapolitanum* are in flower will know that he could use colour lavishly, but it is debatable whether he himself did not lay even more stress on form. He would spend infinite care in pruning the Ivies and the conifers that were planted by the front door to the exact form that satisfied his sense of beauty. His instinct was to be restrained in the use of colour, but he loved leaf form and all sorts of variegations and used them to great effect. His bed of Acanthus and another one entirely composed of grasses and sedges, some gold, some silver, some glaucous and some green, were good examples of his genius in this direction. For BOWLES was an artist. His flower paintings were of no mean order. He used to refer to what he called "the early Bowles's" which hung rather like a stamp collection all over the wall of the staircase at Myddelton House, and the series of pictures which he made of Crocus and Galanthus are among the best flower illustrations of the present day. It is to be hoped that means will be found one day of reproducing them in colour. It was a

great deprivation to him when increasing blindness finally put an end to his own painting, though, as Chairman of the Picture Committee of the R.H.S., he continued to take an active interest in the work of others up to the end.

He was first elected to the Council of the R.H.S. in 1908, and was elected a Vice-President of the Society in 1926, and Vice-Chairman of the Council in 1936, a position which he held until increasing infirmity caused him to relinquish it last year. Those who have attended the Annual General Meetings will always remember with pleasure MR. BOWLES's "little piece," in which he managed, in some way peculiarly his own, to invest the process of making a purely formal declaration of the election of the President with the courtesy and charm of a bygone age.

It would require more than the space available here to record all of BOWLES's activities on behalf of the R.H.S. As Chairman of the Narcissus and Tulip Committee and of the Library and of the Scientific Committees he guided the activities of those committees with great wisdom and almost infinite knowledge over a period of more or less a quarter of a century. In Council he spoke seldom but when he did it was always very much to the point, sometimes devastatingly so. He had that sound and mature judgment that comes of a disciplined mind; and his own ingrained habit of carefulness and self-discipline perhaps made him a trifle impatient of woolliness or inaccuracy in others.

His own personal habits were of the most Spartan sort. A lifelong bachelor, he lived in Myddelton House just as his parents had left it to him. Although so near to London it boasted neither central heating, electric light nor the telephone, and when, as some concession to modern luxury, he installed gas in the kitchen, he berated the workmen who laid the pipe for their lack of care in digging up his lawn. There are vivid recollections of staying with him one February during the war, when his house was without window panes, and the evening was spent in looking up in his very good private library, some recondite points in the nomenclature of Cyclamen, in greatcoats by the light of one oil lamp over a minute wood fire, to the accompaniment of occasional explosions of V-bombs which shook the house. He would work in the garden in all temperatures and all weathers making only minor concessions to the elements in the matter of dress and nearly always in a stiff collar. When he came to London he invariably donned the same blue suit and bowler hat which made him such a familiar figure at Chelsea and at the fortnightly shows of the R.H.S.

BOWLES was a man of profound learning. Throughout a long life he had studied to acquire knowledge on those subjects that interested him. He was a recognized authority on certain genera of plants, notably Crocus, Colchicum, Galanthus and Narcissus, and his general knowledge of plants was encyclopaedic; and he was very rarely wrong in his facts. He had too a very good knowledge of botanical and horticultural literature from classical times down to the present day. In early life he

had collected together a wonderful library full of rare books and early herbals, with all of which he was thoroughly acquainted. In his writings and speech he was most particular in his choice of words and had in a marked degree the scholar's desire to find the precise word that expressed his meaning.

But it was in his garden or those of his friends that the human quality of his learning came out, learning absorbed not only from books but from his observations made in continually working with his hands among his plants. Plants were almost personalities to him. He seemed always to know all about them and to be able to recognize them not only by taste on which he frequently relied, but by some sort of sixth sense. Long after his eyesight had begun to fail he had an uncanny power of recognizing plants at a distance when those with perfect sight were at fault. In his own garden he knew to a nicety where his plants were, whether they were flowering or dormant. Pointing with his two-pronged fork he would indicate exactly where a bulb was to be found, and even whether it was in the first, second or third layer—for his bulbs frequently grew one on top of the other two or three deep.

It was a rich education to go round with him and absorb, now a piece of botanical information, and now an historical anecdote, then a culinary recipe—for he was somewhat of an epicure—or even a fascinating trick like making the pig-squeak on the leaves of Bergenia, which was a joy to old and young alike. And there were many young visitors to his garden. Until he reached a very advanced age he had regularly taken the boys of his parish in Sunday School, and if their tastes were so inclined they were always welcome in his garden of an evening or at the weekend, and when one used to visit him, it was unusual if one or two boys did not turn up during the course of the visit. The only visitor who was not welcome was the person, male or female, who cared not at all for plants but chattered about something else all the way round the garden. He would suffer fools, or what passed with him for fools, with only a very moderate amount of gladness. In human beings the qualities he most valued were accuracy, sincerity and humility, and people who failed to come up to his rather exacting standards in this respect sometimes found that he had a very acid side to his tongue. Those who experienced it, however, were conscious that it was seldom unjustly applied. At his passing a large church was filled to capacity with all sorts and conditions who had come to his funeral. There can be few near-nonagenarians—or "octogeraniums" as he himself would always call them—to whom such a tribute is paid.

L. PALMER.

A GARDEN BY THE SEA

J. R. B. Evison

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IT is November as I write, the wind has been rising for some hours and half-a-mile away high seas are running. Greenhouse ventilators have long been closed and frames not only closed but battened down.

If the usual pattern is followed, the storm will rise with the tide and a blow of some violence may ensue. Tomorrow we shall look for damage. There will certainly be a layer of salty moisture covering everything near to the sea—houses, glass, ironwork, plants, etc. How far back this will extend, depends on the fury of the gale; 2–3 miles is quite unusual and less than a quarter of a mile is much more common. Beyond these distances the effects are those usually associated with high winds. I think these may be more severe beside the sea in that they are not softened by hills or any form of shelter.

I paint this gloomy picture as I find that my friends are inclined to picture gardens beside the sea in terms of those sunny summer days which formed part of a contented holiday. Just as holidays are fleeting, so are perfect days, and winds too are by no means a prerogative of winter. A few years ago I recall the replanting of a chain of gardens right upon the sea-front no fewer than seven times between early June and late July. Equinoxial gales are certainly no mariners' myth!

It would be outside my intention if I have so laboured the storm and tempest as to give the impression that to garden by the sea is a hopeless project. Rather would I have you infer that you must take Mother Nature by the hand and accept her guidance. If we could but ask the plants themselves what boon they would crave most, I am sure they would first ask for shelter. Indeed you can grow anything, which is happy inland in the same locality, beside the sea, provided you give it protection. If it were easy and financially reasonable to provide this shelter, it would be unnecessary to provide a note on seaside planting. You would provide the shelter and take your choice.

The damage to plants with which we are concerned arises from :—

(1) Salt deposit; (2) Wind; (3) Wind bearing spray.

The first two are reasonably obvious, but I do not think that the latter is often given due weight. If a 60 m.p.h. gale is blowing, water borne in the wind can have considerable force on impact—doubtless the fact that it is saline causes the bruised tissue to be more affected.

Most of us have to garden on sites developed by others, but, if starting afresh, I do not think I would choose to try to make a garden near the water's edge. Better a site having a natural barrier between it and the sea in order that this would act as a primary filter to the first fury of wind and water. A hill or woodland would do admirably.

The problem of protecting your own garden then arises. Nothing is superior to a wall but, if that is out of the question, as alas it so often is, then the conditions that would have arisen within that wall must be simulated by a protective belt of plants. This ought to be of a three-fold character and consist of a main protective barrier of trees, shielded to the windward by the toughest of wind-resistant shrubs and embellished on the garden side by resistant but also beautiful subjects.

It is very doubtful whether in a really exposed spot such a shelter belt can be started with large plants, however well established they may be. Many failures have had their origin in impatience.

Protection of a mechanical nature is advisable for the first few years. This can take the form of wattle hurdles of the type often used to give shelter to sheep at lambing, or a strong paling fence thatched with brushwood. These can well take the form of posts 6 feet high and 12 feet apart, connected by two horizontal bars arranged at 2 feet and 5 feet from the ground. Gorse or fir trimmings can be firmly lashed to this to give a 6-foot high protection. Gorse is much more lasting than any other material, but not pleasant to handle!

Within this protection, normal soil cultivation must be carried out. Double digging is ideal, but in view of the large areas which may be involved, digging or mechanical equipment can be used, adding all the humus available.

Planting should be carried out prior to March during the leaf fall of deciduous subjects. Evergreens are happy enough up to May. The young plants should be healthy, stocky, well-rooted and reared in the hard conditions into which they will be planted. It is also important to avoid root exposure to bad weather for any length of time. Close proximity when planting means greater protection and is important. In these circumstances, early thinning is essential. An annual examination is really imperative to attend to such matters as the righting of those plants which are wind-swayed; restaking; the prevention of overcrowding by both thinning and pruning.

So we come to the plants which are best suited to conditions of extreme exposure and of spray drenched air. They must be considered as two groups—(*a*) those whose function is primarily that of shelter and whose appearance is secondary to that function. Among these there is a very select short list of trees. It is obvious that evergreen species are to be preferred. Right in the front rank are some of the Pines and the evergreen Oak. It is very unlikely that there is a finer windbreak than *Quercus Ilex*. Unfortunately it is not easy to establish, is somewhat tender when young, and needs transplanting from a pot as a very small plant—about 12–18 inches high. In spite of this it would always be my first choice as, apart from its quite remarkable wind tolerance, it is one of the most beautiful of our evergreen trees. To provide necessary early shelter for the Oaks, the Cluster Pine (*Pinus Pinaster*), the Austrian Pine (*P. nigra*) and the Mountain Pine (*P. Mugo*), are among the most satisfactory. Three-year seedlings, twice transplanted, and raised in

hard conditions, get away best. In due time, do not forget to thin these Pines away from the evergreen Oaks as, not only does growth take place quickly once started, but they are intolerant of competition.

It may well be that Pines must form the main barrier. Quite a number are suitable, but not all these are particularly decorative. My own first choice would be *P. muricata*, or Bishop's Pine. Like *P. radiata* it hails from the Monterey Peninsula where plants are not unaccustomed to high winds and drenching spray. It comes as something of a surprise that such a lovely plant can be surprisingly tough. *P. nigra* var. *calabrica*, the Corsican Pine, is also a quite first-rate tree for wind shelter in poor soil. The exceptional value of the Austrian, Mountain and Cluster Pines has already been mentioned, especially in the North.

Deciduous species are not so useful as they are bare just when shelter is most sorely needed. They have their uses however and outstanding among them are the White Poplar (*Populus alba*), particularly on sandy wastes. Where it is cut down regularly to about 6 feet it forms a thicket of shoots and large leaves, greatly welcomed by less hardy kinds in the leeward.

Among the Balsam Poplars, so delightful for their fragrant breath, *P. trichocarpa* has given a consistently good account of itself and, more recently, I have been pleased with the behaviour of *P. Tacamahaca*.

Of our native or naturalized trees, Ash, Elm, and Sycamore have most chance of making a useful contribution.

So far we have only dealt with the main denizens of a large scale shelter belt, but it would be wrong to suppose that all gardens need shelter on such a large scale. For them there are a surprising number of good small trees or large shrubs ready to do duty. This same list is also needed in association with the Pines, etc., which we have been considering, as many of them tend to bare bases as they grow. It is advisable therefore to plant an outer belt of really wind-resistant shrubs and screen the inner side with hardy but perhaps more decorative subjects.

First the really tough. I want to pay a much needed tribute to *Euonymus japonicus* in those areas where it is hardy. It is so ubiquitous! It forms a dingy background to so many untended gardens and squares in southern England that it has drawn to itself the opprobrium usually reserved for the Spotted Laurel and the Privet. Of course it survives in these places because of its immense good nature—hardly any other plant has a sufficiently robust constitution. Its proper role is that of the protective hedge and here it has no superior in the face of the sea. I have clipped hedges only a few yards from high water mark and one remarkable hedge against the protected cliff face, half a mile long and 60 feet high. This is now about 60 years old and, though trimmed back pretty hard each winter, it berries freely and is a remarkable sight when its fruits split open, Celastrus like, to reveal orange scarlet seeds in a golden cup (Fig. 74).

If *Euonymus japonicus* is king among the protective evergreens,

then the Sea Buckthorn (*Hippophae rhamnoides*) must rule among the deciduous shrubs; even down on the sea-shore this remarkable shrub will thrust defiant arms into the wind. It is one of the very many grey-foliaged plants which do well under sea spray. Somewhat willow-like in appearance, it is unisexual and, to make sure it is allowed to achieve its principal claim to beauty—month after month that glorious show of golden berries—both sexes need to be planted. A group of males to the windward of the females is usually quite successful. One male to about ten females. I believe grafted plants bearing both sexes are available.

A quite indispensable group are the Olearias. I doubt if their best friends could call the flower of these species particularly beautiful or spectacular, but many have an attractive personality to go with their undoubted excellence as wind resisters in the milder counties. *Olearia Traversii* is not nearly so well known or so widely used as it ought to be. Perhaps it is that it is so fast growing, that many who have tried it have failed to realize that it needs heading back severely during its early years to ensure really stocky growth. It needs planting as very small plants and will make a thicket of 20 feet in very few years.

O. macrodonta will make a plant of similar size. It has large Holly-like leaves with a predominantly silvery appearance. It flowers most profusely in early summer, the whole bush subsiding under a foam of white flowers. My only memory of the scent of Musk is as a small child crawling down a cottage garden path. The scent of these flowers vividly restores that early recollection. Other smaller but exceptionally tough Olearias are *O. Haastii* and *O. albida*. There are very few other plants I would care to recommend for the outer belt; Tamarix, Blackthorn, *Salix caprea*, *Spartium junceum*, *Lycium chinense*, the Hawthorn and Gorse, and you have them all.

Assuming this belt to have started to grow nicely, you can begin to build up the inner protective belt and here a very much wider selection becomes available, especially in southern England. It would seem that even more plants will come within our repertoire if the suggested movement of the Gulf Stream to warm the waters of the Channel is indeed established as a fact. There seems worthwhile evidence to this end; certainly the water in the Channel is warmer than a few years ago and marine life has manifestly changed. It may well be worth following the work of the oceanographers in this connection. What a boon it would be if, to take one example, the genus Metrosideros, so decorative and so windhardy, were to be made available to much wider areas by an extension of the frost-free zone in which it flourishes at present.

The qualities we are looking for in this last zone of garden protection are a reasonable degree of wind and spray resistance, together with garden beauty in that we shall be looking at these plants from our garden. They can of course be used anywhere else where circumstances recommend it.

Cistus—Probably *C.* × *pulverulentus* is the most wind hardy. Like

so many plants mentioned in this note it has grey foliage. Possibly the protective hairs or waxy bloom which usually give the grey appearance account for this resistance to seaside conditions. I have seen this plant right down on a sandy foreshore smothered with its lilac pink flowers and seemingly perfectly happy.

This genus is one of the happiest for the impatient; no-one is likely to regret planting the lovely *C. ladaniferus* with its splendid white flowers having each central boss bejewelled with a circlet of magnificent rubies. *C. laurifolius* is probably the hardiest of the rock roses; in a dry place it has few superiors, whilst apart from its white flowers it gives off a delightful aromatic perfume under a warm sun. One can hardly do without *C.* × *cyprius*, probably a natural hybrid between the two Cistus mentioned above. It has the inflorescence of *C. laurifolius*, with the crimson splashed flower of *C. ladaniferus*. With justice many consider it the most beautiful of outdoor Cistus. Lastly, among those I have space to mention, is the smaller but quite lovely *C.* × 'Silver Pink,' the clearest rose pink among these attractive shrubs. Its origin is unknown.

Cornus—One would hesitate to recommend *C. stolonifera*, the red osier dogwood and its yellow-barked form *C. s. flaviramea*, if it were not that in large plantings it is sometimes necessary to have cheap, easily propagated species available. Their winter effect is of course very much worth while if a dark background where the winter sun may light them up can be devised. They must be cut down annually to get the best results as the young wood is much the more vividly coloured.

Cotoneaster—This magnificent family contains some of the most valuable wind hardy shrubs for exposed gardens. *C. frigida* is a small tree or large bush bearing large bunches of brilliant red berries. It is a somewhat variable plant as it has been much propagated by seed. This has its advantages when such lovely varieties arise as 'Cornubia' which has particularly large, vividly scarlet berries, and has had its excellence recognized with an F.C.C. It adds wind tolerance to its other qualities. *C. bullata*, *C. pannosa* and *C. rotundifolia* are others of marked merit. Birds permitting, the last named will keep its fruit into the spring. To me *C. lactea* has the most beautiful shape of all the Cotoneasters. Its naturally arching boughs are spangled first with clusters of pale young foliage and, in autumn, with a curtain of small red berries.

Escallonia—One of the most useful of seaside-loving genera; *E. rubra* is probably the hardiest, rather straggly in growth and needing frequent trimming if used as hedging. It has a dwarf form, *E. pygmaea*, with similar rosy crimson flowers.

The bright rose-red flowered *E. macrantha* is one of the most commonly planted species. It is one of the "gummiest" of the genus, which appears to give it immunity from the fiercest and saltiest storms. Plant it small, give it room to grow, keep it well cut back to prevent straggling and you will have an exceedingly handsome windbreak. It has a number of children, among them erect forms such as *E.* × 'Red

Hedger' and *E.* × 'Ingramii.' Quite different are the hybrids, many from the Donard Nurseries. Their origins are somewhat complicated but all are graceful shrubs with long slender arching sprays, heavily bespangled with starry flowers, rich rosy red in 'Donard Beauty'; pink and white in 'Donard Seedling'; deep carmine in 'Glory of Donard'; 'C. F. Ball' is carmine red, 'Donard Brilliance', dark crimson and 'Slieve Donard' pink. Their constitution is certainly less vigorous than *E. rubra* or *E. macrantha* and they are less hardy than *E. virgata* whose blood most of them possess.

Genista hispanica—The Spanish Gorse is quite indispensable in the seaside garden. It may not prefer it, but it is certainly better to give it a poorish soil to grow in, hot and dry for preference. It will then roll out into a veritable miniature South Downs of deep green spiny branchlets. In May the whole will disappear under a mantle of golden yellow blossom. It has a tendency to die out in patches, so a few plants should always be available in reserve.

Griselinia littoralis has little claim to beauty, but does make an excellent hedging plant in the most windy spots. Its hardiness is suspect, but I am inclined to think it is tougher than many have given it credit for. It moves well as a fairly large plant and so makes a good plant to use when a quick shelter is required.

Fuchsia—I hope none will be deceived by the delicate appearance of *F. magellanica* and its numerous progeny. They are quite invaluable in providing flower in late summer and autumn, even into December. *F. m.* var. *riccartonii* and *F. m.* var. *gracilis* are probably the most frost-hardy. The latter grew wonderfully well at my boyhood home in the Cheshire hills with no more protection than a shovelful of ashes during the winter. They can be very effective when planted on a low retaining wall.

Hydrangea—With the Fuchsias, this is probably the most opulently decorative of the summer shrubs. I think there is room for both *H. macrophylla*, the familiar mop-headed form, in many shades of pink, blue and white, and the flat-headed, perhaps more beautiful type, *H. m.* var. *normalis*. If your soil be lime free, 'Blue Wave' is an especially lovely form. As a scrambler over an inhospitable bank or a north wall, one can do much worse than use *H. petiolaris*.

Muehlenbeckia complexa, will do much the same job as the last-named Hydrangea even closer to the sea. It produces an amplitude of tiny wiry dark stems with minute heart-shaped leaves forming a dense thicket in supreme indifference to wind and spray .

Senecio—We are indebted to Australasia for supplying quite a number of grey-foliaged, yellow-flowered species of this attractive genus. *S. Greyii* and *laxifolius* are well known in the milder parts as wind hardy, regularly smothering their grey foliage with golden corymbs of daisy-like flowers but, as *S. rotundifolius* becomes better known, it may prove even more useful. Its resistance to the severest exposure is really quite extraordinary. It sits out in the wildest gale quite

unconcerned. I could wish it were a little hardier, though evidence is most contradictory on this point.

Ulex—Gorse is probably the toughest of our native plants. As a wild plant it has few superiors but, in the garden, only the double form *U. europaeus florepleno* is really worthy of a place. It does not dissipate its flower throughout the year, as does the native form, but gives a first-class display in the early months of spring.

Veronica—We can really consider these in two groups. The protective species such as *V. brachysiphon*, *V. salicifolia* and its variety *Kirkii*; *V. Dieffenbachii*, *V. speciosa* and *V. elliptica* and its hybrid 'Blue Gem' are invaluable, though, with the exception of *V. speciosa* and *V.* 'Blue Gem,' they have a tendency to become bare at the base after a few years. The decorative species and varieties are not nearly so hardy but, given a little shelter, they are exceptionally decorative plants. 'Alicia Amherst,' also known as 'Veitchii' and 'Royal Purple,' is a magnificent *speciosa* hybrid, with deep royal purple flowers; 'La Seduisante,' a bright crimson with bronzy foliage; 'Simon Deleaux,' wine crimson and 'Gloriosa,' a bright pink are among the best.

Having established both shelter and foundation shrubs around one's garden, the door is open to the planting of a much wider range of plants than is possible for one's friends but a few miles inland, due of course to the reluctance of vast waters to give up their latent heat as opposed to land masses. Even so, there are herbaceous and alpine subjects which appear to revel in the sight of the sea. Almost the whole Carnation family for example; the Mesembryanthemums, so gay and lovely in the sun, particularly *M. aurantiacum* (bright orange), *M. roseum* (deep pink), *M. violaceum* (violet purple), *M. Brownii* and its hybrids (orange-scarlet); and, of course, that charming little annual, the 'Livingstone Daisy'—*M. criniflorum*—in a host of pastel shades of pink, orange, yellow and blue. These plants usually need the winter protection of a frame, as do the Gazanias, who contrast so well with the Mesembryanthemums. *G. splendens*, with its orange flowers and black-ringed eye, is well known and has given rise to a number of fascinating hybrids with flowers of white, lemon yellow, orange, red, brown and green as well as many other shades. Sunshine and sharp drainage are essential to both Mesembryanthemums and Gazanias.

Few plants do better than *Aubrieta deltoidea* near the sea. Its very good nature tends to make it a little hackneyed but, if full use is made of the wide range of colour now available, many a disagreeable, difficult bank can become an unforgettable springtime sight, and good garden forms include 'Carnival,' purple violet; 'Fire King,' rosy red; 'Grandiflora,' rose purple and 'Pritchard's A.,' deep violet. Equally happy is that vigorous ramper *Campanula Portenschlagiana* which, once established, pours a cascade of attractive foliage over walls and banks. It is very free with its light blue-purple flowers.

The salt and wind tolerance of the Kniphofia is not generally

realized. They are a feature of the cliff plantings at Whitley Bay on our N.E. coast—hardly the most hospitable of our coastlines. It certainly merits wider planting than has been customary. *K. rufa*, *K. praecox*, *K. Tuckii*, *K. uvaria* and most of its varieties, are probably best suited.

A number of silvery grey plants are outstandingly successful really near to the sea. *Senecio cineraria*, better known as *Cineraria maritima*, is really tough. The more tender *Senecio leuchostachys* is a more attractive plant, but probably needs half-hardy treatment. *Stachys lanata*, the Lamb's Tongue, appears to have supreme contempt for storm and tempest.

I have always wondered at the wind and salt tolerance of Mallow. Both the annual *Lavatera trimestris* and the biennial *L. arborea* have a resistance one would not expect from a casual examination. Sown among thin shrubs they will naturalize and provide a glorious show year by year.

Contrast in shape and form are as welcome in the seaside garden as anywhere else; among the plants which by the architectural quality of their form provide this essential element, together with resistance to spray and wind, are the New Zealand Flax; *Phormium tenax*, whose 6-foot sword-like leaves have considerable varietal variation; and the Yuccas, which are most effective in creating a subtropical effect and are probably much hardier than commonly thought. *Y. gloriosa* is among the largest and is a quite magnificent plant in form. Its creamy flowers are produced in late summer in panicles up to 6 feet long and 2 feet wide. It is regrettable that this glorious sight is not regularly produced. *Y. filamentosa* and *Y. flaccida* are dwarfer and much more free-flowering —they should be used if regular flower is especially desired. The 12-foot lemon-scented spire sent up by *Y. Whipplei* is probably the finest produced by any species commonly grown here. One could wish that more of the hybrids raised by SPRENGER in the early part of the century were still in commerce. It would indeed be welcome if *Y.* × *vomerensis*, said to be not only the most handsome but also the hardiest, could be rescued.

I do not think that anyone with experience of the vagaries of a seaside garden will quarrel with the highest priority being given to the provision of shelter in the most attractive manner possible. Having done so, exactly the same principles govern the design of the garden as are applicable inland, but there are a few characteristics common to most seaside sites which it may be helpful to consider.

A well-designed garden should be restful and this may be accentuated near the seaside by the provision of ample, well-screened, sitting places along sheltered walks. On boisterous gusty days, these spots are veritable havens of calm and quiet.

Light intensity is usually exceptionally high; this gives full justification to the use of the pergola as a garden feature and points a warning against the use of too light a stone, or other material, for paths and drives, lest the glare be irritating.

In planning, the pictorial value of the sea should not be overlooked in the effort to provide adequate shelter. If natural vistas can be exploited they should be. I would hesitate before cutting an existing planting to create a vista however—it is so easy to produce an exquisite picture for the sunny, balmy summer evening that can on so many other days be the wind funnel which spreads destruction far and wide.

RECENT DEVELOPMENTS IN THE USE OF INSECTICIDES ON HORTICULTURAL CROPS

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DEVELOPMENT OF SYNTHETIC ORGANIC INSECTICIDES

THE discovery of synthetic organic insecticides has made the control of many pests possible for the first time. Before the discovery and introduction of these new chemical compounds many pests defied control. What are the factors which have made these new materials so potent and so useful? First of all, by pests is meant principally insect or allied pests such as the plant-feeding red spider mites, not birds, rodents and pests of this kind. There is little doubt that the principal ravages of food and allied crops are caused by insects and it is in the extermination of these that synthetic organic compounds have proved valuable.

The first compound to become available for trials against insects was DDT—a Swiss discovery. This was shortly followed by benzene hexachloride, a British discovery, and later parathion, a German discovery. When DDT became tested many claims were made for it which, it is now known could not possibly have been true. This was probably an expression of enthusiasm on the part of the research workers. Most of the trial work with benzene hexachloride (BHC) was carried out in this country and even today more is known about BHC here than elsewhere. Parathion suffers from the disadvantage of being poisonous to human beings but is probably the most active of all compounds yet discovered against the widest range of insect and allied pests.

The three compounds possess the following advantages over older materials such as nicotine, lead arsenate, derris, etc., viz.:

1. Chemical stability.
2. Toxicity in small dosages.
3. Standard materials.

Returning now to the original statement that many pests are controllable for the first time, the wireworm, formerly the most important pest of agricultural crops, is now well controlled by BHC. This insecticide was first used as a broadcast treatment at 6 lb. BHC per acre. Latterly emphasis has been placed on seed-dressings containing BHC. These make use of the fact that the insecticidal properties reside in the gamma isomer, representing about one-eighth of the total. This can be extracted, purified and forms the basis of the seed-dressing developed for wireworm control in cereals and sugar beet. Used in this way only about 1 to 2 oz. of the gamma isomer is needed per acre, a distinct advance in economy and application of a chemical made possible by the factors already mentioned.

One of the first pests for which DDT was tried was apple blossom weevil. This insect caused the well-known loss of blossom in apples due to those attacked failing to open. This pest had been investigated for many years without a successful control being discovered. It could be classed as a major European unsolved problem. The advent of DDT eliminated apple blossom weevil; a bud burst spray of 1 lb. per 100 gallons gave such a complete control that few fruit growers spray against apple blossom weevil any more.

Parathion was developed principally against the plant-feeding red spider mites and its use more or less reserved for this purpose in the first few years. Later, however, many additional uses came to light among which must be mentioned the high activity of parathion to species of plant parasitic eelworms such as chrysanthemum eelworm, root knot and potato root eelworms. Parathion also made the treatment of many field crops, such as sugar beet economically possible for the first time.

Having built up a case for the development of synthetic compounds, it must be stated that DDT, BHC and parathion represent only a few of those now available. Many other synthetic compounds have been made, particularly in the U.S.A. Only a few of these have become available upon the British market.

HORTICULTURAL CROPS

Horticulture has always absorbed more insecticides than agricultural crops in this country, probably because:

1. Most horticultural crops are attacked by an insect complex, probably because many are static and not rotational, e.g. fruit, glasshouse.
2. The margin of expenditure for the control of pests is greater in high monetary value crops.
3. It is essential on many horticultural crops to control pests to avoid total crop failure.

Horticulture can be broadly divided into three groups—fruit, glasshouse and nursery, and market garden culture. There are many pests of

fruit trees as most people know, and these are dealt with by means of a spraying programme. Thirty years ago very little fruit tree spraying was carried out but over the next twenty years many changes and developments in spray chemicals and machinery took place. Fruit is now a high quality crop demanding high cultural practice, an essential part of which is spraying for the control of pests and diseases.

FRUIT TREE SPRAYING

Since the war, however, probably even greater changes have taken place in a few years, not the least being the introduction of synthetic chemicals into the spraying programme. Apple blossom weevil had been eliminated by DDT as explained. Apple capsid bug soon followed, but probably the most revolutionary change was the departure from the old-established winter spraying programme of tar oil and petroleum oil. This has been made possible by the value of BHC and parathion against aphids and red spider (4). The whole of the apple spraying programme can now be based upon sprays applied in the spring, including DDT, BHC and parathion which will control all the principal apple pests. In fact, woolly aphid is now controllable for the first time if BHC is used, whereas hitherto there has been no satisfactory chemical control. Apple sawfly has been so well controlled by BHC that it is losing its importance as a pest. It is indeed remarkable that some pests are actually being eliminated in this way.

Probably the fruit tree red spider is the only remaining pest of apples about which there has been some doubt of the ability of chemicals to control. The first use of parathion in 1949 and 1950 gave some remarkably good kills but nowadays red spider resistance appears to be occurring; parathion in 1953 did not appear to be as good in some orchards as it did formerly. It is said that the use of DDT and parathion has led to the increased importance of red spider on apples in this country. It is very difficult to be certain of this as memories are short. Bad attacks certainly occurred in pre-war years as, for example, in 1937. There is much confusion of thought upon this subject. Certainly DDT, BHC and parathion are known to kill insect and other predators normally living upon the red spider mites. This need not necessarily lead to red spider outbreaks. In the opinion of the writer the physiological state of the tree, health of the foliage and condition of the leaves is a more important factor in red spider multiplication than the presence or absence of predators. Upon healthy, vigorous trees the rate of red spider multiplication can be enormous. Late build-up of red spider populations after spraying is associated with the preservation of the foliage in good condition, serving as food for the mites. This food, if destroyed in the summer months, leads to a decline in population.

Other synthetic chemicals have recently become available in this country for use against red spider, notably the chlorinated phenyl sulphonates and sulphides of which CPCBS* appears at present to be

* *p*-chlorophenyl-*p*-chlorobenzene-sulphonate.

the most satisfactory. Particular interest attaches to these compounds because they are non-poisonous and, unlike parathion, can safely be used without special protective clothing (now required by law for certain phosphorus insecticides). Furthermore, these sulphonates are non-insecticidal, meaning that they don't kill insects. CPCBS applied at ½ lb. per 100 gallons in June and July has proved extremely effective against the fruit tree red spider. It is particularly active against the eggs and young stages, while being non-toxic to the fully developed adult. For this reason this type of compound is sometimes called a summer ovicide but actually its activity lies in its pronounced persistence, 1 lb. per 100 gallons remaining active upon the treated leaf for 4 to 6 weeks. It is hoped that the introduction of these compounds may provide the fruit grower with a chance of wiping out red spider as a pest. No better type of compound—non-toxic and non-insecticidal—could have been found as a follower to parathion.

Application has also been improved since the war. Fruit-tree washes can now be applied with modern automatic sprayers including the latest air-blast machines. These machines operated by one or at most two men enable about 20–25 acres a day to be sprayed. A further development is the low-volume sprayer, enabling about 10 acres to be sprayed in as little as an hour (2, 3).

GLASSHOUSE AND NURSERY PESTS

The most important glasshouse pest is the red spider mite which attacks all the principal crops, viz. cucumbers, tomatoes, carnations, roses and vines, except chrysanthemums and lettuce (Fig. 79). Hitherto the chemical sprays used were white oil and derris. Particular interest, therefore, followed the discovery that azobenzene possessed acaricidal properties. The idea of using azobenzene came to us from U.S.A. where evaporation of paste applied to hot pipes was the technique used. In this country azobenzene was formulated as a smoke generator and in 1949 smoke generators containing azobenzene were used on a large scale. The idea of smoking glasshouses was not new and the incorporation of DDT and BHC in smokes for the control of insect pests was an important advance in the smoke technique.

The principal interest, as stated, attached to azobenzene because it became the first smoke to be used against red spider. Unfortunately, red spider resistance to azobenzene soon developed upon cucumbers. This was due to the inability of azobenzene to kill the fully grown adult mite, being principally ovicidal. During 1949, however, parathion was also being tested in smoke generators and it was soon found that the adult mites were well killed by parathion. In 1950 it was therefore possible to offer the glasshouse grower a new smoking technique using both azobenzene and parathion together, which proved highly successful and is still in use to-day, four years later. The pairing of azobenzene with parathion is an interesting example of mutual benefit by bringing two chemicals together. In U.S.A. 8 gm. azobenzene per

1,000 cu. ft. of glasshouse space was the rate employed. This amount was at first used in this country. For action against the egg stage of red spider it can be cut down to 2 gm. In the case of parathion 0·5 gm. per 1,000 cu. ft. is sufficient to kill the adults but to kill eggs at least 5 gm. per 1,000 cu. ft. would be necessary. By using both types of generator together a total of only 2·5 gm. of acaricide is required (1).

Parathion will also kill most other glasshouse pests such as aphids, leaf-miner, leaf-hopper and young caterpillars. It is also the most effective material yet found against whitefly, both immature stages and eggs being killed to a high degree. Other smoke generators such as those containing DDT and BHC possess a more limited use, DDT being employed against caterpillars such as tomato moth and BHC against aphids such as the chrysanthemum aphids. Both generators are unsafe on cucumbers.

A further technique has been developed parallel to that of the smoke generator, that is the use of atomized sprays. Applied by means of an air compressor such sprays can be perfectly atomized to give a thin fog or mist in the glasshouse. The action of smokes and atomized liquids is much the same, especially for DDT, BHC and azobenzene. The droplet or particle size emitted from smokes is very much smaller than that from atomizing liquid which tend therefore to fall more rapidly out of the atmosphere and deposit themselves upon the floor of the house.

Unfortunately, the most valuable compound, as with smokes, is parathion, and this is far too hazardous to be used as an atomized spray. It can be done, however, with success provided that a respirator is worn and full protective clothing (not necessary for parathion smokes). A much more practical way of using parathion is the high pressure or liquefied gas aerosol. This is a self-contained unit filled under pressure, usually containing about 10 per cent. parathion. Such high pressure dispensers have been used with success in U.S.A., Holland and latterly in this country. Parathion deposits from such aerosols can be detected chemically on surfaces after treatment. Such deposits are very small and of little significance. Deposits from parathion smokes are, however, usually far too small to be detected (5).

In the coming season there is little doubt that new chemicals will be available for atomizing by air compressors, or similar apparatus, to the glasshouse grower. Red spider ovicides are already available and appear to be very suitable and cheap for red spider control on carnations and tomatoes. At present, however, these chlorinated compounds appear to be of doubtful safety on cucumbers. Some interest surrounds the new chemical "Malathion" from U.S.A. This is similar to parathion but can be used without recourse to protective clothing. Malathion can be atomized in a glasshouse like parathion and is very toxic to aphids, whiteflies and to some degree, red spiders. It would appear to be a very useful addition to the range of atomizable fluids especially for use on cucumbers.

A word or two might be said about new ways of controlling two

important chrysanthemum pests—leaf eelworm and midge. For the control of leaf eelworm, warm-water steeping of chrysanthemum stools has been a standard practice and apparatus has been designed for this purpose. In 1949 the possibility of controlling eelworm with parathion sprays was announced (6). Parathion is very toxic to eelworms and possesses the property (as does malathion) of penetrating into plant tissues. It was shown that spraying chrysanthemums with parathion two or three times during the season, from the rooted cutting stage, would entirely prevent eelworm attack. Moreover, if eelworm symptoms appeared in the plant, parathion treatment could arrest its spread and kill it out. Parathion will also control aphids, and leaf-miner, and so the grower is able to employ a cheap and effective substitute for the warm-water treatment.

Chrysanthemum midge was formerly a notifiable pest but is no longer so. Routine sprays with BHC will keep it in check and prevent its establishment in nurseries. Parathion, however, if used at the right strength, will kill the larval stage within the insect gall and eliminate an attack immediately.

SYSTEMIC INSECTICIDES

Mention must be made of systemic insecticides, compounds possessing the power of entering into plants and being translocated in the sap, rendering the plant toxic to certain insects. Such compounds are fascinating and very novel but at present rather over-rated, as their activity is limited and cost high. Probably the best known systemic is schradan. This is very expensive and toxic only to aphids and red spider. Schradan is normally applied as a spray and at the moment is commercially used on hops, strawberries and a few other crops.

A more useful but more poisonous systemic insecticide is "Systox," now available in this country. Systox is much more potent than schradan at much lower dosages. It is also cheaper. The most interesting feature of Systox, however, is its ability to enter freely through the plant root system, a property not possessed by schradan to the same degree. Systox can therefore be applied by watering the plant with a Systox wash, a simple and safe procedure. By this technique it is possible to control aphids, leaf-hopper and red spider absolutely and render the plant immune for as long as desirable. Such a procedure is especially suitable for flowers such as carnations, chrysanthemums and roses, and ornamentals of various kinds. Normal rates will clear an infestation and keep the plants free for about a month. Higher rates can be used on some plants and remain effective for longer periods. Watering with Systox is not cheap but can be effectively carried out with a diluter such as is used for certain liquid fertilizers.

Development of techniques for the control of pests on market garden and other horticultural crops has really depended upon the manufacture of suitable spraying and dusting equipment. Probably the most useful piece of equipment is the low-volume ground crop sprayer designed for

hormone weedkillers. This sprayer can be used for such pests as lettuce aphid and flea beetles. Less notable and far reaching advances have been made on this type of crop.

In conclusion it may be said that the production of high grade crops such as fruit and others mentioned above, necessitates the use of modern methods. Among these must be included the use of chemicals both as fertilizers and for the control of pests, diseases and weeds. Without them crop culture returns to primitive peasant farming which every so often is marked by a failure leading to famine.

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PLANTS AND PROBLEMS VII

A PROBLEM OF RAISING SEEDS

Question. Just after the war I moved from Worthing and bought a house on acidic soil where Rhododendrons and Heathers grow beautifully. To increase the variety of these plants I have tried to raise many of them in my greenhouse from seeds but the results have been almost a complete failure. Can you kindly tell me how to succeed with the seeds of these plants?

Answer. Many small-seeded Ericaceous plants such as Rhododendrons and Heathers are easily raised from seed provided that certain conditions are fulfiled.

At Wisley seeds of Rhododendrons and Heathers are sown in granulated peat. The peat is thoroughly soaked, placed in a pot, well firmed and then, after the sowing has been made, it is covered with a fine "sugaring" of sand just sufficient to "anchor" the seeds. Afterwards the surface of the pot is covered with glass to prevent evaporation of water and a sheet of newspaper laid over the top of the glass to protect the surface of the compost from the direct rays of the sun. If sown in this way and placed in a warm greenhouse at a temperature of 55°–60° in the spring, the seeds will germinate in about 2–3 weeks. The important points to remember are that the peat must be definitely acid in reaction (*p*H 4·5–5·5) and that the sand must not show an alkaline reaction. In addition, the seeds must never be buried deeply and in point of fact can be left on the surface of the compost without any covering whatsoever.

Photo, Wykeham

FIG. 68—E. A. BOWLES, Vice-President of the Society and Vice-Chairman of Council
(See pp. 290–293)

FIG. 69—An informal Shrub Garden, exhibited by Messrs. L. R. Russell Ltd., Windlesham, for which a Gold Medal was awarded

Photos, J. E. Downward

FIG. 70—A Formal Garden, exhibited by Messrs. R. Wallace & Co., Tunbridge Wells, for which a Gold Medal was awarded

FIG. 71—A Rock Garden, exhibited by Messrs. Gavin Jones (Nurseries) Ltd., Letchworth, for which a Gold Medal was awarded

Photos, J. E. Downward

FIG. 72—A Rock Garden, exhibited by MR. GEORGE G. WHITELEGG, Knockholt, for which a Gold Medal was awarded

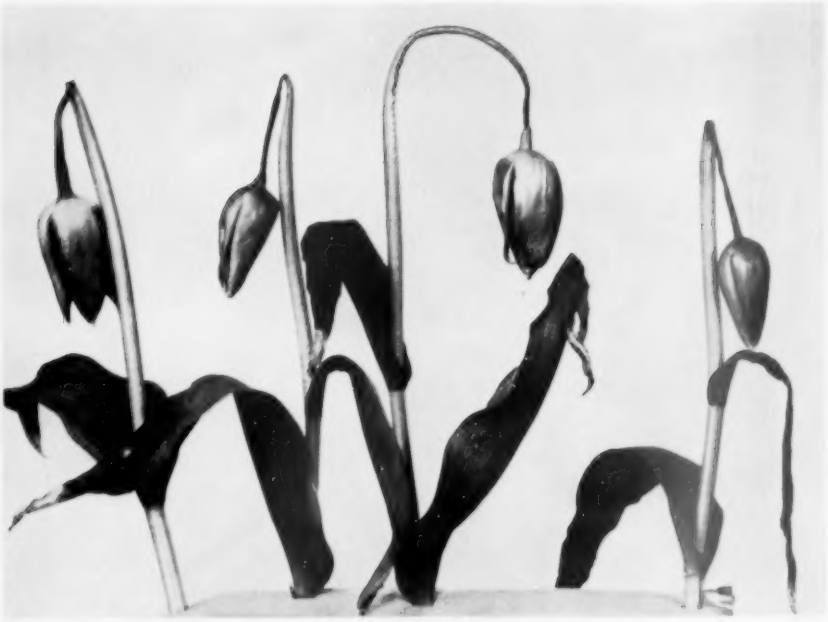

FIG. 73—Desiccation of stems of Tulips after a severe storm

A GARDEN BY THE SEA

Photos, Deane & Millar Ltd.

FIG. 74—A hedge of *Euonymus japonicus* placed against a cliff face at Brighton
(See p. 296)

Photo, Birmingham Post & Mail

FIG. 75—General view of the garden from the northern end (See p. 313)

A GARDEN FOR THE BLIND

FIG. 76—A low stone wall showing the placing of a label printed in Braille (See p. 314)

FIG. 77—View along the pergola path in the garden for the blind (See p. 314)

Photo, B.O.A.C.

FIG. 78—The packing of Orchids for transport by air (See p. 318)

Photos, Plant Protection Ltd.

FIG. 79—The Greenhouse Red Spider on Tomato at the webbing stage (See p. 305)

FIG. 80—Apple tree showing bad leaf curling caused by the Rosy Aphis

FIG. 81—*Magnolia salicifolia* at Clarendon Park, Salisbury (See p. 315)

WEEDS IN A BED OF IRISES

Question. In my garden there is a special bed which I have always devoted to Irises. Lately it became heavily infested with Ground Elder and my husband lifted the Irises and dug out the roots of the weed. Now, to my dismay, the weed seems to persist as much as ever. What can I do?

Answer. Ground Elder is a persistent plant and the first attempt at the removal of the roots generally has little effect. The best means of eradicating the weed in the bed is to lift the Irises in June when flowering has finished and fork out as many roots of the Ground Elder as possible. However carefully this is done a number of roots are usually missed and further systematic removal of the roots is necessary *as soon as new growth of the weed is seen.* In the following spring a dressing of manure can be dug into the bed and the surface dusted with superphosphate at the rate of 2 oz. per sq. yard. Thus the soil is suitably enriched and with the weed controlled replanting can be done a year after the plants are lifted.

THE CULTIVATION OF NEW ZEALAND SPINACH

Question. Please would you tell me how to grow New Zealand Spinach as I have heard that it will stand dry weather without bolting?

Answer. New Zealand Spinach (*Tetragonia expansa*) is, as you say, not liable to bolt in summer and thus makes an excellent substitute for the common Spinach especially on hot dry soils. New Zealand Spinach is not hardy and for early summer use it should be sown under glass in March, pricked out into boxes and, after hardening off, planted in late May. However, the easier way to grow it is to sow the seeds in the open ground in May in shallow drills 2 feet apart. The seed may be steeped in water before sowing as it is sometimes slow to germinate. If they can be adequately watered the plants will provide side shoots bearing many thick fleshy leaves which are picked for cooking, until the first frosts come.

VEGETABLES FOR SUMMER AND AUTUMN SOWING

Question. Please could you recommend me some vegetables for late sowing?

Answer. The following vegetables can be recommended for sowing in July and early August to produce an autumn maturing crop:

Beetroot 'Detroit Globe'
Carrot 'Nantes'
Endive 'Green Curled'
'Batavian'
Kohl Rabi 'Early Vienna'
Lettuce 'All the Year Round'
Pea 'Little Marvel'
Radish 'French Breakfast'
Spinach Beet
Turnip 'Snowball'

The following vegetables may be sown between July and October for maturing in early spring:

Cabbage 'Harbinger'
'Flower of Spring'
Cauliflower 'All the Year Round' (protected in frames for the winter)
Lettuce 'Arctic'
'Imperial'
'Winter White' (Cos)
Spinach 'Long Standing Prickly'

STRAWBERRY VARIETIES

Question. Having grown Strawberry 'Royal Sovereign' very successfully I am now anxious to extend the fruiting season by planting one or two more varieties. Can you please advise me which ones to grow?

Answer. For early crops 'Perle de Prague' is a good variety. 'Cambridge Favourite' is an alternative and is widely used for early crops under cloches. To follow 'Royal Sovereign' you can do no better than use the new and highly popular 'Auchincruive Climax.' This ripens approximately one week after 'Royal Sovereign.'

It should be borne in mind, however, that by using certain methods 'Royal Sovereign' itself can be made to cover a comparatively long period. Cloching will give crops up to two or three weeks in advance of the main crop whilst a warm and sheltered south border can advance ripening by a week or so.

Certified virus-free stocks are available of all the above varieties and every effort should be made to obtain these when making fresh plantings. Any old virus-infected plants must be burned otherwise they will only act as a source of infection for the new bed.

POOR CROPPING OF RASPBERRIES

Question. The Raspberries we have never seem to crop to capacity although they are perfectly healthy. Whilst the first flush of fruit is of good size the remainder is invariably small and many fruits do not develop at all. What measures can we take to improve the yield?

Answer. Lack of moisture at the roots is the probable cause of the trouble. Raspberries are surface rooting and are therefore very easily affected by drought particularly on the lighter soils. A generous mulch should be applied in early spring whilst the soil is still moist. Well decayed farmyard manure is ideal but failing that decayed lawn mowings, peat, leaf-mould, or spent hops can be used. Such a mulch must extend for at least 15 inches on either side of the row and should be at least 3 inches in depth.

In a very dry summer regular and copious watering may also be necessary especially where insufficient material has been available for mulching.

ROSE AND PEA MILDEW

Question. What can I do to prevent mildew on my Roses and Peas?

Answer. The mildew diseases which form a whitish coating on the leaves and shoots of Roses and Peas are caused by different fungus parasites although the symptoms they exhibit are very much alike. For Rose mildew spray with colloidal copper white oil, which is also recommended for Black Spot disease, according to maker's instructions. At Wisley we have often used with good results lime sulphur, at a strength of $\frac{1}{4}$ pint in $2\frac{1}{2}$ gallons of water, with an efficient spreader. Before spraying cut off the ends of any shoots of climbing and rambler Roses which were affected by mildew last year as it is on these injured shoot tips that the fungus parasite overwinters. Mildew is usually worst on Roses, and especially on climbing Roses, in warm and sheltered spots. It is important to remember that plants which suffer dryness at the roots are more prone to mildew attack and thus such dryness must be guarded against, especially in the case of Roses growing against walls, by mulching or even by occasional watering.

Pea mildew is often severe on late Peas because the early ones are left standing and often become infected with mildew. They ought to be pulled up and the haulms disposed of as soon as picking is finished. In some seasons late rows when young can be crippled by mildew and they should be sprayed with colloidal copper as above. On light soils and in dry seasons the question of dryness at the roots must also be considered and mulching should be done with some kind of humus between the rows. Even with this an occasional watering may still be necessary.

MICHAELMAS DAISY WILT

Question. Please can you give me some advice about the browning of leaves in some of my Michaelmas Daisies?

Answer. Perennial Asters (Michaelmas Daisies) are subject to a wilt disease in the roots caused by the fungus parasite *Verticillum Vilmorinii.* The signs are that on some or even on all the stems, starting from the base and working upwards, the leaves become brown and wither so that in summer part of a clump, or even the whole clump, may look brown and dead. The parasite remains in the root stock and may be spread by division. If an infected plant can be spared it should be burnt but if not the only way to avoid the spread of this disease is to propagate by taking cuttings from the top 1 or 2 inches of the suckers. Do not take *rooted* suckers from an infected plant in case the parasite has already passed into the base of such suckers. Plant the clean rooted cuttings on a fresh site. Of all the types of Michaelmas Daisies only the Novae Angliae types do not take this disease.

PHLOX EELWORM

Question. Can you tell me the likely cause of the condition of the enclosed Phlox plants? The topmost leaves are narrow and twisted, others are bloated and crinkled, and some of the stems are stunted and have split. The Phlox have been dying off one at a time but other plants in the herbaceous border appear quite healthy.

Answer. The Phlox are infested with Stem and Bulb Eelworm, *Ditylenchus dipsaci.*

It is advisable to burn heavily infested plants and to immerse those less severely attacked in a warm water bath at a constant temperature of 110° F. for one hour during the dormant season.

No Phlox, Gilia, Collomia or Oenothera should be grown on the infested soil for at least three years. The raising of clean stock from untreated plants is only possible by means of seed or root cuttings.

ANTS

Question. We have a border that is infested with ants. It would not do to let them spread and I am afraid they will come into the house. Can you recommend anything to control them?

Answer. Five per cent. BHC (Benzene hexachloride) gives an effective control of ants and most proprietary ant killers are based on this substance. The nests should be located if possible and after being opened up with a spade should be dusted with the insecticide. In addition, the dust should be sprinkled around their haunts, especially along the footings of the house at points where the ants may gain entry.

BHC formulations should not be applied to vegetables or land intended for these crops during the next two years since produce may become tainted. For a similar reason the dust should be kept away from foodstuffs.

NOTES FROM FELLOWS

A Garden for the Blind

At a meeting in January 1953, the City of Birmingham Parks Committee decided to supplement the pleasure and enjoyment which sighted persons derived from the city's parks and various horticultural features by providing a garden primarily for the use of the blind.

Work on the project was commenced in March of that year and the Garden—a lasting feature to commemorate the Coronation of H.M. Queen Elizabeth II—was officially opened on July 31st by Mr. W. J. Sharp the "Unknown Blind Man" of radio fame.

The old-established grass terrace of Court Oak House in Queen's Park was selected as the site as this park is located only some 300 yards from the premises of the Birmingham Royal Institution for the Blind

where approximately a quarter of the city's blind population either live or work. Further, apart from one pedestrian crossing, the park can be reached wholly by the use of footpaths, thus permitting blind people to make the journey unaccompanied.

The Garden is roughly rectangular in shape and measures approximately 40 yards by 50 yards (Fig. 75). It was designed after consultation with the Superintendent of the Birmingam Royal Institution for the Blind and embodies the following principal features :—

1. The western and southern boundaries are made by a rustic pergola on which climbing scented plants are grown.

2. On the northern and eastern boundaries, York stone retaining walls have been built to support raised borders so that the fragrance of low-growing plants may be appreciated without undue stooping.

3. A small raised pool equipped with a fountain has been provided so that the sound of splashing water can be heard and enjoyed in all parts of the garden.

4. There are four raised Rose beds each containing a distinct variety encircling the pool.

5. The path leading from the park entrance to the Garden is provided with a high "tapping" kerb for the guidance of the blind users. Within the Garden itself, however, the paths are unkerbed and made flush with the level of the bordering turf with the exception of the path within the pergola where it was felt that kerbing was essential to prevent the roots of the climbing plants from being walked upon. All the Garden paths have been constructed of a York stone impregnated concrete slabbing possessing a dimpled and relatively non-slip surface and at the points where two paths intersect or join each other a 3-foot-square brick inset has been made so that its different textures may be of guidance to indicate a point of turning.

6. Four tub-grown shrubs of Bay (*Laurus nobilis*) have been placed at the centre of the Garden where the two main paths intersect so that blind users may determine their exact position.

7. In the southern half of the Garden, there are two fine specimens of Copper Beech, each of which has been provided with a hexagonal seat to be reached by crossing a section of Camomile lawn.

8. A garden shelter facing south-west has been built into the corner where the two retaining walls meet and has been so designed that it is neither dangerous nor affords obstruction to blind people feeling their way from the one wall to the other.

9. All plants are labelled with their botanical and common names in Braille.

10. Nesting boxes have been placed in the trees to encourage birds to frequent the garden.

11. A metal embossed plan of the Garden and its immediate surrounds has been situated at the park entrance so that blind people may become acquainted with the features of the layout prior to entering the Garden and also determine its approach from the park entrance.

As would be expected, the general scheme of planting has been undertaken with species valued for their fragrant flowers or foliage. On the pergola, for example, great use has been made of the Honeysuckles and in addition to *Lonicera Periclymeneum*, *L. japonica* and its subspecies *flexuosa* and *Halliana*, *L. americana* and *L. Caprifolium* have been used. Other fragrant climbing species include *Actinidia arguta*, *A. polygama*, *Akebia quinata*, *Clematis orientalis* and *C. Pavoliniana*, *Ceanothus azureus* and the hybrid 'Gloire de Versailles,' *Schizandra chinensis*, *Stauntonia hexaphylla*, *Vitis vulpina* and *Wistaria floribunda*. In addition Sweet Peas, Nasturtiums and tall plants of *Eucalyptus globulus* were used quite extensively to supplement the permanent planting during the first summer (Fig. 77).

On the raised borders, the majority of the common garden herbs are prominently featured—Thyme, Sage, Pennyroyal, Balm, Tarragon, Fennel, Tansy, Chives, Mint, Basil, Marjoram, Savory and Angelica. Extensive use was also made, however, of many of the delightful old garden favourites such as Mignonette, Sweet Alyssum, Pinks, Carnations, Lavender, Cherry Pie, Candytuft and Lily of the Valley but the annuals have of course been replaced by plantings of Wallflowers and Hyacinths for the spring.

Fragrant shrubs have not been omitted and individual species have been placed in appropriate positions throughout the two raised borders. There are *Osmanthus Delavayi*, *Chimonanthus praecox*, *Skimmia japonica fragrans*, *Lippia citriodora*, *Daphne Mezereum*, *Choisya ternata*, *Artemisia Abrotanum* and *Rosmarinus officinalis*, in addition to low-growing species of Juniper, Chamaecyparis and Thuja.

The question of whether Roses should be included in a garden for blind people was considered at some length and it was finally decided that provided they were isolated in a particular position and not planted in a general mixed border where they might be grasped unaware, there was no serious objection to their use. As a result, four raised beds were constructed around the pool and planted with the varieties 'Lady Sylvia,' 'Mary Wheatcroft,' 'President Hoover' and 'Ophelia' which, although certainly possessing thorns, are amongst the less serious offenders. As a further precaution, the fact that these beds were planted with Roses was indicated on the embossed metal plan of the garden used by the blind people to familiarize themselves with the various features of the layout prior to entering the garden itself.

The labels which have been used to identify the various plants and shrubs are made up of a plate of thin copper measuring 6 inches by 3 inches screwed into a hard wooden backing. Upon this copper plate is embossed the common and botanical name of the species in Braille lettering. These labels have been fixed horizontally to the coping of the retaining walls by the use of Rawlplugs and the planting has been so arranged that a group of plants is growing in the border directly behind the point at which the label is fixed (Fig. 76). On the pergola each label is screwed onto the lower rail of the structure—which

incidentally can be used as a hand rail—and is positioned immediately to the side of the growth of the particular species.

The interest which the inauguration of this special Garden has created has been widespread and most gratifying. People employed in the offices and workshops of the Birmingham Royal Institution for the Blind visit the garden regularly and often during their lunch hour. There have been organized coach trips from Blind Institutions of neighbouring towns and it is now learned that the Birmingham School for the Blind is planning to use the garden in its syllabus of training for Botany and Horticulture. The City of Birmingham Parks Committee feel, that in the establishment of the Garden they have made a valuable contribution to the enjoyment of those persons whose particular requirements cannot always be met in the larger expanses of the city's parks.

S. PITTMAN, D.SC., N.D.H.

Senior Horticulturist,
Parks Department,
City of Birmingham.

Magnolia salicifolia

The tree shown in Fig. 81 is one of eight plants acquired in Japan in the summer of 1906. It was planted at Britwell Court, Burnham, Bucks., in the spring of 1907, and was moved to its present position at Clarendon Park, Salisbury, the property of MAJOR S. V. CHRISTIE-MILLER, in 1920.

The height is over 40 feet; it grows on the southern slope of a glade where there is ample moisture. The soil is entirely lime-free.

M. salicifolia is easily recognized by the aromatic scent of bark, leaves and seed pods.

Two plants were moved from Britwell; one, which was of more fastigiate habit, died a few years ago.

C. W. CHRISTIE-MILLER

Swyncombe House,
Henley-on-Thames.

Coloured Species of Zantedeschia

The coloured species of Zantedeschia do not seem to be very popular nowadays, judging by the difficulty one has in obtaining them. I have found the following method of cultivation to be most successful. I plant them during April or May in shallow wooden boxes with slatted bottoms, which are partially filled with compost containing bonemeal. The tubers are placed upon this and partially covered. The boxes are then placed on a prepared soil bed in about 55° F., and as the leaf sheaths elongate and the white roots appear round the eye, these are

covered with extra layers of compost. I prefer this method, to growing them in even the largest pot, because :—

1. The roots can never dry out, because the ground can be thoroughly watered.

2. The roots pass through the slats during summer and get extra nourishment and water and free range.

3. In autumn (October) the boxes are lifted from the earth bed and placed on sanded corrugated iron staging. In this way the extra roots are broken and the boxes can be *gradually* dried off. Subsequently the foliage is removed as it becomes loose and the tubers are then removed from the soil and placed upside down on the sanded staging, which should be kept dry. In this way, the tubers are completely dried, and the roots become detached from the eye.

Later I bury the tubers in dry builders' sand in boxes, in a frost-proof place. These plants enjoy high humidity and light shading. The above method particularly suits *Z. melanoleuca* var. *tropicalis* and other kinds.

If any other Fellow is interested in these plants, will he please write to me.

ANTHONY COCHRANE

61 East Church Street,
Buckie,
Banffshire

Erica australis

The February cold spell provided a new opportunity to observe how this admirable shrub stands up to really cold conditions. *Erica australis* and its white variety 'Mr. Robert' have a reputation with many gardeners for being somewhat vulnerable to frost. The writer pointed out in October 1951 (Vol. LXXVI, part 10) that these heaths will stand much more cold than is commonly supposed and the recent wintery spell has borne this out. Due to the earlier exceptionally mild winter our *Erica australis* (of which we have many to a height of 3 feet) were well advanced in flowering buds when the weather changed. We had very little snow in Essex, but the black frost continued for ten days on end, temperatures at night reading from 12 to 20 degrees below freezing with biting north-easterly winds. There was, however, very little hoar frost until just before the thaw. The ground was frozen for 6 to 8 inches down.

The shrubs have suffered no damage whatsoever, and 'Mr. Robert,' which is further advanced in bud than the type and which is generally considered a little less hardy, is also quite unscarred and is now (April) in full bloom whilst *E. australis* will shortly follow suit.

I feel that Fellows who have been afraid to grow these lovely heaths should not refrain from doing so just because they have heard they are not quite hardy. Our own plants have now weathered many winters

without loss and there is no more beautiful sight in the garden in April and May than these heaths completely covered, as they are, with flowers. They delight in each other's company and should certainly be planted in groups.

Erica Pageana

This beautiful yellow South African heath cannot be grown out of doors in England, but is surprisingly resistant to cold when kept in an Alpine house or cold green house. This year they have stood 12° to 15° of frost and the pots have frozen solid without the plants taking harm. If, however, they had been growing in the open garden there is no doubt they would have perished.

L. W. SMITH

Hornchurch, Essex.

Polyanthus 'Golden Prince'

Does anyone still grow *Polyanthus* 'Golden Prince'? I remember the plant 'Golden Prince' in my father's Canonry garden at Salisbury about 1905. The flowers grew on vigorous upright stems—bunched rather like an Oxlip—golden yellow—rather brighter than 'Barrowby Gem' and petals stiffer and standing up to rain or wind. They made a very showy narrow border.

In an old letter from MR. NELSON, Rector of Aldborough, May 23, 1876, he writes "I have been in correspondence with a friend and 'Golden Prince' was the object of it—the history of the plant is this, though the origin I cannot tell you—I grew it in my garden as a small boy and my father and I have kept it going till now ; a few years ago no one cared for such things, but when people began to make a fuss over 'Golden Plover' I thought the old Norfolk Polyanthus deserved notice and I sent a plant dug-up in flower to HENDERSON of Wellington Road which he potted, named it 'Golden Prince' and got a first class certificate for it at South Kensington—I then became aware of its superiority to anything of its kind and set to work to propagate it. I gave it to INGRAM, and WARE's stock came from me. I see he charges 2s. 6d. for it. It is much easier to manage than most of the Primrose family."

ISABEL A. TRACEY

High Hall,
Wimborne.

Orchids by Air

The fact that we ship bloodstock from the British Isles to many parts of the world may be a surprise to some, but the shipment of British-raised hybrid Orchids to parts of the world whence came at least one of the original species is of special interest, especially both because of the ability to send plants by air, and their value in earning foreign currency.

The success of these consignments much depends on skilled packing, and the fact that "repeat orders" have been sent speaks well of this work. Other factors involved are the condition of the plants and the season of the year. Fifty years ago old hands will remember that the majority of Orchids grown in this country were imported from their native habitat, and the earliest sendings came by sailing ships eighty years ago. The memory of unpacking these native species is of many quite dead and others which one could only hope to save with much difficulty and care.

All this has changed and the tide flows the other way—an industry has been created in Australia through shipments of Cymbidium hybrids from England which are grown and flowered at a different season to that in which they flower in the Northern Hemisphere. The flowers are flown back at a time of the year when they are out of season in the United States and Europe, and are very welcome.

Of course expert packing enters into the successful shipment of Orchids by air. Changes made from the days when plants were sent by sea in "Wardian Cases" (boxes glazed like miniature greenhouses) are of a natural sequence. Some exporters use cardboard boxes, others boxes of aluminium, but this would appear of little consequence. No ventilation is given, but a factor is the relative dampness of the plants. They must not be wet, and yet not quite dry, although they should be more on the dry side than the wet. Firm packing is essential, as although the packages are carefully handled by the aircraft people, firmly packed plants travel better.

On the occasion of the recent visit of H.M. THE QUEEN to Melbourne, we read that she was presented with a bouquet of Orchids containing white hybrid Cattleyas from the same source as those used in her wedding bouquet. This means that the original plant was flown out from England, thus enabling the proud Australian grower to provide this flower.

The lesson that growers at home have derived from home-raised hybrid Orchids is that they are more easy to cultivate than imported species; indeed if such Orchids are properly grown in houses according to their pedigree, they are easier to cultivate than many plants found in greenhouses today. The illustration (Fig. 78) shows the method of shipping these plants from the Crowborough, Sussex, nursery of Messrs. Stuart Low Co.

L. J. COOK

WISLEY TRIALS, 1953

BRUSSELS SPROUTS

Sixty stocks of Brussels Sprouts were received at Wisley for trial during 1953, and in addition commercial stocks were obtained of the following to act as control varieties: Dwarf Gem, Cambridge Special, Cambridge No. 1, 3, 5, Express, XXX, Timperley Champion. The trial was sown on March 3, 1953, and planted out May 29, 1953. The plants were spaced 3 feet apart each way. The trial was inspected by a sub-committee of the Fruit and Vegetable Committee on October 1 and 26, 1953, and on its recommendation the Council of The Royal Horticultural Society has made the following awards to Brussels Sprouts. The number in brackets after the description of the stock is that under which it was grown in the trial.

AMAGER. (Sent by Messrs. L. Daehnfeldt Ltd., Odense, Denmark.) **A.M.** October 26, 1953.—Plant 2 feet 10 inches high; foliage medium size, dark dull grey green. Sprouts 1⅝ inch diameter, 2 inches long, fairly tightly placed; stands well. An even stock. [28]

ATLAS SLUSIA ORIGINAL. (Raised, introduced and sent by Messrs. Abraham Sluis Ltd., Enkhuizen, Holland.) **A.M.** October 26, 1953.—Plant 2 feet 8 inches high; foliage small, dark dull grey green with stalks slightly tinged with purple. Sprouts 1 7/10 inch diameter, 1⅛ inch long, tightly placed; stands well, very even stock. [37]

AMAGER IMPROVED. (Raised, introduced and sent by Messrs. J. E. Ohlsens Enke, Linnesgade 14, Copenhagen, Denmark.) **H.C.** October 1, 1953.—Plant 3 feet high; foliage medium size, medium dull grey green stalks tinged with purple. Sprouts 1 1/10 inch diameter, 1⅛ inch long, very solid, tightly placed; stands well. [27]

CAMBRIDGE SPECIAL. (Raised, introduced and sent by The National Institute of Agricultural Botany, Huntingdon Road, Cambridge.) **H.C.** October 1, 1953, as an early variety for market use.—Plant 2 feet 9 inches high; foliage medium size, grey green, stalks long, slightly tinged with purple. Sprouts 1½ inch diameter, ⅝ inch long, tightly placed; stands well. [7]

DWARF SPECIAL. (Introduced and sent by Messrs. G. R. Vatter Ltd., Bärenplatz 2, Bern, Switzerland.) **H.C.** October 1, 1953, as an early dwarf variety for private garden use.—Plant 1 foot 4 inches high; leaves small, medium grey green. Sprouts 1½ inch diameter, 2 inches long, tightly placed; the earliest stock in the trial. [6]

LEIGHTON'S AMBASSADOR. (Raised by Messrs. Gladwin Bros., introduced and sent by Messrs. A. G. Leighton Ltd., Whitchurch, Shropshire.) **H.C.** October 1, 1953.—Plant 2 feet 10 inches high; leaves medium size, light grey green. Sprouts 2 inches diameter, 2⅜ inches long, very tightly placed; stands well. [19]

MASTERPIECE. (Raised, introduced and sent by Messrs. D. T. Brown & Co. Ltd., Poulton-le-Fylde, Lancs.) **H.C.** October 1, 1953, as an early variety for general use.—Plant 3 feet high; leaves medium size, light yellowy-grey green. Sprouts 2⅛ inches diameter, 3 inches long, tightly placed; stands well. [20]

ROUS LENCH SELECTED. (Raised by Mr. N. F. Boswell, sent by Messrs. W. Deal & Sons Ltd., Kelvedon, Essex.) **H.C.** October 26, 1953.—Plant 2 feet 9 inches high; leaves medium-large, dull grey green. Sprouts 1½ inch diameter, 2 inches long, tightly placed; stands well. [34]

SANDA. (Raised by Mr. C. Beemsterboer, introduced and sent by Messrs. C. Beemsterboer Pty. Ltd., Warmenhuizen, Holland.) **H.C.** October 26, 1953.—Plant 2 feet 8 inches high; leaves medium-large, dark dull grey green. Sprouts $1\frac{9}{10}$ inch diameter, $2\frac{1}{10}$ inches long, very tightly placed; stands well. [25]

SPEED'S LANCASTRIAN. (Raised by Mr. H. J. Speed, introduced and sent by Messrs. H. J. Speed & Sons Ltd., Evesham, Worcs.) **H.C.** October 26, 1953.—Plant 2 feet 8 inches high; leaves small, light dull grey green. Sprouts $1\frac{3}{10}$ inch diameter, $1\frac{3}{8}$ inch long, tightly placed; stands well. [51]

YATES' GIANT LATECROP. (Raised, introduced and sent by Messrs. Yates & Sons (Seeds) Ltd., Evesham, Worcs.) **H.C.** October 1, 1953.—Plant 2 feet 3 inches high, leaves small, light dull grey green. Sprouts $1\frac{1}{4}$ inch diameter, $1\frac{3}{8}$ inch long, tightly placed; stands well. [65]

LEEKS

Thirty-seven stocks of Leeks were received at Wisley for trial during 1953. The trial was sown on March 2, 1953, and planted out on June 17, 1953. The planting distances were 1 foot between the rows and 9 inches between the plants in the row. The trial was inspected by a sub-committee of the Fruit and Vegetable Committee on November 16, 1953, and January 25, 1954, and on its recommendation the Council of The Royal Horticultural Society has made the following awards to Leeks. The number in brackets after the description of the stock is that under which it was grown in the trial.

SUTTON'S ROYAL FAVOURITE. (Raised, introduced and sent by Messrs. Sutton & Sons Ltd., The Royal Seed Establishment, Reading, Berks.) **F.C.C.** November 16, 1953.—Plant 2 feet high, leaves $3\frac{1}{2}$ feet long, light grey green; stem 7 inches long, 2 inches diameter, a very even stock. [20]

YATES' EMPIRE. (Raised, introduced and sent by Messrs. Yates & Sons (Seeds) Ltd., Evesham, Worcs.) **F.C.C.** January 25, 1954.—Plant $1\frac{1}{2}$ foot high, leaves $3\frac{1}{4}$ feet long, very dark green; stem 6 inches long, $1\frac{1}{2}$ inch diameter, a very even, late maturing stock. [33]

ERDA PERFECTED. (Raised, introduced and sent by Messrs. L. Clause S.A., Brétigny-sur-Orge (S.-et-O.), France.) **A.M.** November 16, 1953.—Plant 2 feet high, leaves $3\frac{1}{4}$ feet long, dark grey green; stem 11 inches long, $1\frac{1}{4}$ inch diameter. [25]

SUTTON'S IMPROVED MUSSELBURGH. (Raised, introduced and sent by Messrs. Sutton & Sons Ltd.) **A.M.** November 16, 1953.—Plant $1\frac{1}{2}$ foot high, leaves 3 feet long, light grey green; stem 6 inches long, $1\frac{1}{2}$–2 inches diameter. [14]

SWISS SPECIAL DUBOUCHET. (Raised, introduced and sent by Messrs. G. R. Vatter Ltd., Bärenplatz 2, Bern, Switzerland.) **A.M.** November 16, 1953.—Plant 2 feet high, leaves $3\frac{1}{2}$ feet long, light grey green; stem 8–9 inches long, $1\frac{1}{2}$–2 inches diameter. [22]

WALTON MAMMOTH RESELECTED. (Raised, introduced and sent by Messrs. Watkins & Simpson Ltd., 26–29 Drury Lane, Covent Garden, London, W.C. 2.) **A.M.** January 25, 1954.—Plant $1\frac{1}{2}$ foot high, leaves 3 feet long, medium grey green; stem 5 inches long, $1\frac{3}{4}$ inch diameter. [1]

CLUSEED EVEREST. (Raised by Mr. A. A. Clucas, introduced and sent by Messrs. J. L. Clucas Ltd., Ormskirk, Lancs.) **H.C.** November 16,

1953.—Plant 2½ feet high, leaves 3 feet long, light grey green; stem 5 inches long, 2 inches diameter. [10]

ELEPHANT. (Raised, introduced and sent by Messrs. N. V. Sluis & Groot's Koninklijke Zaadteelt & Zaadhandel, Enkhuizen, Holland.) **H.C.** November 16, 1953.—Plant 1¾ foot high, leaves 3 feet long, light grey green; stem 5½ inches long, 1¾ inch diameter. [9]

ERDA. (Raised, introduced and sent by Messrs. L. Clause, S.A.) **H.C.** November 16, 1953.—Plant 1¾ foot high, leaves 3 feet long, light grey green; stem 6 inches long, 1½ inch diameter. [24]

GENNEVILLIERS. (Sent by Messrs. L. Daehnfeldt Ltd., Odense, Denmark.) **H.C.** January 25, 1954.—Plant 1¾ foot high, leaves 2¾ feet long, light grey green; stem 7 inches long, ¾–1½ inch diameter. [12]

HIGHLAND GIANT. (Raised, introduced and sent by Messrs. L. Clause, S.A.) **H.C.** November 16, 1953.—Plant 3 feet high, leaves 3½ feet long, dark grey green; stem 5 inches long, 2 inches wide. [19]

LYON RESELECTED. (Raised, introduced and sent by Messrs. Watkins & Simpson Ltd.) **H.C.** November 16, 1953.—Plant 2 feet high, leaves 3¼ feet long, medium green; stem 5 inches long, 2 inches diameter. [26]

NORTHUMBRIAN. (Raised, introduced and sent by Messrs. Harrison & Sons (Leicester) Ltd., St. James' Street, Leicester.) **H.C.** November 16, 1953.—Plant 1¾ foot high, leaves 3 feet long, grey green; stem 6 inches long, 1½–2 inches diameter. [16]

PRIZETAKER RESELECTED. (Raised, introduced and sent by Messrs. Watkins & Simpson Ltd.) **H.C.** November 16, 1953.—Plant 1¾ foot high, leaves 2½ feet long, light grey green; stem 5 inches long, 1¾ inch diameter. [31]

WALTON MAMMOTH. (Introduced by Messrs. Watkins & Simpson Ltd., sent by Messrs. W. Deal & Sons Ltd., Kelvedon, Essex.) **H.C.** November 16, 1953.—Plant 1½ foot high, leaves 4 feet long, light grey green; stem 6 inches long, 1½ inch wide. [3]

WESTLANDIA GIANT WINTER. (Raised, introduced and sent by Messrs. Gebr. van den Berg N.V., Westlandsche Zaadteelt & Zaadhandel, Naaldwijk, Holland.) **H.C.** January 25, 1954.—Plant 1½ foot high, leaves 3½ feet long, dark grey green; stem 6 inches long, 1½ inch wide. [37]

WINTER GIANT. (Raised, introduced and sent by Messrs. N. V. Sluis & Groot). **H.C.** January 25, 1954.—Plant 1½ foot high, leaves 3 feet long, grey green, stem 6 inches long, 2 inches wide. [17]

PLANTS TO WHICH AWARDS HAVE BEEN MADE IN 1954

Ardisia crispa A.M. January 19, 1954. An evergreen shrub 3 to 4 feet in height with oblong-lanceolate, tapered, wavy-margined leaves up to 4 inches long. The small pinkish flowers are clustered at the ends of many short lateral branchlets, and they are followed by red, Holly-like berries which persist until the next flowering season. Exhibited by the Director, Royal Botanic Gardens, Kew.

Arundo Donax variegata A.M. March 30, 1954. A very handsome grass for the cool greenhouse, where it produces a stout, erect

stem 6 feet tall. The two-ranked leaves, each 2 feet long, $2\frac{3}{4}$ inches wide and tapering to fine points, are inserted at regular 4-inch intervals. The leaf has a central band marked with green and glaucous longitudinal stripes, on either side of which is an ivory-white marginal band $\frac{3}{4}$ inch wide. Exhibited by L. Maurice Mason, Esq., Talbot Manor, Fincham, King's Lynn.

Begonia crispula A.M. March 16, 1954. The award was recommended to this plant for its decorative foliage. The strongly bullate, sage-green leaves, which are $4\frac{1}{2}$ inches wide and orbicular-reniform in shape, overlap one another in a flattish rosette, from which rise very slender red scapes bearing small whitish flowers. Exhibited by L. Maurice Mason, Esq., Talbot Manor, Fincham, King's Lynn.

Buddleia × 'Madagasiatica' 'Margaret Pike' F.C.C. February 16, 1954. This decorative hybrid received the **A.M.** on February 17, 1953, and it is described in the JOURNAL **78**, p. 185. Exhibited by Col. J. J. Astor, Hever Castle, Edenbridge, Kent.

Burchellia capensis A.M. March 30, 1954. A South African evergreen shrub with large, ovate, dark green leaves and scarlet, tubular flowers about an inch long arranged in dense heads at the ends of the branchlets. Exhibited by the Director, Royal Botanic Gardens, Kew.

Cyclamen 'Burgundy' A.M. January 19, 1954. A very handsome free-flowering variety with large intense Cyclamen Purple (H.C.C. 30) flowers measuring $2\frac{1}{2}$ inches long and having the corolla lobes very sharply reflexed. The foliage is large and beautifully marked. Raised, introduced and shown by Messrs. Blackmore and Langdon, Twerton Hill Nursery, Bath.

Primula denticulata 'Prichard's Ruby' A.M. March 30, 1954. An attractive Magenta Rose (H.C.C. 027) variety of this well-known hardy Primula. Its flowers are produced in globose crowded heads and the plant appears to be of good constitution. The parentage is given as *P. denticulata* × *P. denticulata rosea*. Raised, introduced and exhibited by Messrs. M. Prichard & Sons, Ltd., Riverslea Nurseries, Christchurch, Hants.

NARCISSI

Narcissus 'Royal Charger' A.M. April 13, 1954, as a variety for exhibition. A brilliantly coloured Large-Cupped Narcissus with a flower 4 inches in diameter, borne on a stout 20-inch stem. The Canary-Yellow (H.C.C. 2/2) perianth segments were smooth and overlapping, the outer ones being $1\frac{3}{4}$ inch long and $1\frac{11}{16}$ inch broad. The neat Marigold-Orange (H.C.C. 11) cup, which was slightly pleated and indented at the margin, was just over $\frac{5}{8}$ inch long and $1\frac{5}{16}$ inch in diameter. Raised and shown by Mr. J. L. Richardson, Prospect House, Waterford, Eire.

Narcissus 'Signal Light' A.M. April 13, 1954, as a variety for exhibition. A striking bicolor Large-Cupped Narcissus with a flower about $4\frac{1}{8}$ inches in diameter, borne on a good 21-inch stem. The white perianth segments were broad and overlapping, the outer ones being

1¾ inch long and nearly as broad. The wide-mouthed Orpiment-Orange (H.C.C. 10/1) corona, which was slightly frilled and indented at the margin, was nearly ¾ inch long and about 1¾ inch in diameter. Raised and shown by Mr. J. L. Richardson.

Narcissus 'Lapford' A.M. April 13, 1954, as a variety for exhibition. A refined bicolor Trumpet Narcissus with a flower 4¼ inches in diameter, borne on a 19-inch stem. The white perianth segments were smooth, very broad and overlapping, the outer ones being just over 1¾ inch long and 2 inches broad. The shapely Sulphur-Yellow (H.C.C. 1/2) corona was approximately of the same length as the perianth segments and about 2 inches in diameter at its reflexed and slightly indented margin. Raised and shown by Mr. Guy L. Wilson, M.Agr. V.M.H., The Knockan, Broughshane, Co. Antrim.

Narcissus 'Forthright' A.M. April 27, 1954, as a variety for exhibition. A well-formed, richly coloured Large-Cupped Narcissus (Division IIa) with a flower nearly 4½ inches in diameter, well poised on a stout 18-inch stem. The Aureolin (H.C.C. 3) perianth segments were broad, overlapping and very smooth, the outer ones being 1¾ inch long and slightly more across. The Buttercup-Yellow (H.C.C. 5) corona was 1 5/16 inch long and 1¾ inch in diameter at its slightly expanded and indented margin. Raised by The Brodie of Brodie, and shown by Mr. Guy L. Wilson.

Narcissus 'Prestige' A.M. April 27, 1954, as a variety for exhibition. A large white Trumpet Narcissus (Division 1c) of good substance, with a refined flower just over 5⅛ inches in diameter, borne on a stout 17-inch stem. The white perianth segments were smooth, very broad and overlapping, the outer ones being 2⅛ inches long and nearly as broad. The white trumpet-shaped corona was 2¼ inches long and nearly as much across at its reflexed and frilled margin. Raised and shown by Mr. Guy L. Wilson.

Narcissus 'Tornamona' A.M. April 27, 1954, as a variety for exhibition. A neat pure white Large-Cupped Narcissus (Division IIc) with a flower 4½ inches in diameter, borne on a 19-inch stem. The white perianth segments were smooth and overlapping, the outer ones being 1⅞ inch long and 1⅝ inch broad. The white cup-shaped corona was about 1 5/16 inch long and 1¾ inch in diameter at its expanded and evenly indented margin. Raised and shown by Mr. Guy L. Wilson.

BOOK NOTES

"Insecticides and Colonial Agricultural Development." Edited by T. Wallace and J. T. Martin. 169 pp. (with a list of members attending the Symposium.) Illus. (Butterworths Scientific Publications, London.) 1954. 30s.

This work consists of the Proceedings of the Sixth Symposium of the Colston Research Society, held in the University of Bristol—March 23–27, 1953.

A concise Foreword by Sir Havergal Downes-Shaw, O.B.E., President, Colston Research Society, Bristol, and a brief Preface by Professor T. Wallace, is followed by an able survey illustrating the importance of crop protection to the Colonies and its relation to agricultural development.

The sixteen papers, each presented by an authority in his own particular field, cover a very wide range of subjects, including the following: "The Control of Locusts by Insecticides," "The Control of Pests of Cotton in Tropical Africa," "A Problem of Insecticides and Biological Control in East Africa," "Losses Caused by Insects during Storage and Transport," "The Control of Ectoparasites of Livestock" and "Spraying Technique and Machinery."

It will be noted that these papers cover a very wide range of problems, and are representative of widely separated districts.

The volume contains all the papers read at the Symposium and full reports of the discussions arising from them.

A list of Members attending the Conference concludes the volume.

Finally, the emphasis throughout the book stresses the need of further research in relation to crop protection in the Colonies, and in particular the use of insecticides and of measures of biological control.

This work is indispensable to all those concerned with increased crop production in the Colonial territories.

A. M. MASSEE

"Weed Control" (2nd edition). By Wilfrid W. Robbins, Alden S. Crafts and Richard N. Raynor. McGraw-Hill. 57*s*. 6*d*.

When *Weed Control* first appeared in 1942 it was undoubtedly the most important book which had been published in this field for more than a decade. Not only did the contents embrace a balanced review of the merits of cultural and chemical means of weed eradication, but there was much new information concerning the many and varied investigations undertaken by the authors in California. Yet within three years the book was largely out of date, for 1945 ushered in the era of synthetic growth regulators as potent and selective herbicides. Since then the pace of development has been fast and furious; many new compounds have been acclaimed as even better herbicides, many have failed to live up to the initial expectations and there has been a mounting torrent of papers and articles, some scientific and others more concerned with the exploitation of individual herbicides.

In the early post-war years, it would have been impossible to have attained any balanced judgment of these new developments, and the authors have wisely waited until some of the dust of conflicting claims has settled before publishing this second edition. Even now, it is almost impossible for any book to be completely up to date since several hundred papers from all parts of the world appear each year, and yet the authors have managed to include an initial assessment of most of the latest compounds.

From the more practical aspects, the authors stress the efficiency and performance of the several major herbicides under American conditions, and it is by now well established that measures which may be appropriate in one country or region may not be applicable in Britain. Nevertheless, for all those who want a conspectus of the scope of weed control and possible methods of application this book will provide it. The contents will particularly appeal to university students, to those working in an advisory capacity and research workers engaged in other fields of investigation. The expert within the field, may question whether the discussion of the physiological and selective action of herbicides at the level of a "text-book and manual" has completely escaped the pitfalls of over-simplification.

G. E. BLACKMAN

Reprinted by kind permission of the Editor of *Agriculture* and Professor G. E. Blackman from Vol. LX., No. 6.

"Australian Plants for the Garden." By Thistle Y. Harris, B.Sc. Illus. xiv + 254 pp. (Angus & Robertson Ltd.) 63*s*.

This is a book for Australian gardeners. The opening chapters discuss garden planning and construction, propagation, planting, pruning, etc. They include some explanation of plant names, popular and scientific, matters of which gardeners might profitably know more, though the need is not apparent for more than a page on the choice of names by authors, with vague reference to the "Report of the International Botanical Congress," especially when the subject of "Plants and Soil" has to be condensed to a chapter of barely two pages. Soils and manures are briefly treated, but the investigation of soil *p*H with litmus paper seems unnecessarily crude when cheap and simple colorimetric outfits are obtainable. Propagation by seed is helpfully explained

and illustrated, but the diagrams of budding are small and obscure, and the explanation of grafting, without illustrations, is as vague as it is brief.

The greater part of the book consists of lists of plants for particular purposes, with brief notes on each. Occasionally one is led to infer that certain plants found in Australia, e.g. *Potamogeton natans*, *Vallisneria spiralis* and several Lemnas, are peculiarly Australian. Some confusion surrounds *Tristanea laurina* which is said to occur also in New Zealand, but its native name Kanuka there means *Leptospermum ericoides*. *Olearia paniculata*, on the other hand, is a New Zealand plant, but it is not possible from the description given to know if this is the plant intended. Bentham's misunderstanding of the distribution of *Callitris robusta* is perpetuated.* So far from being an inland species, its type locality is Rottnest Island.

The photos in black and white are generally more satisfactory than those in colour, and there are some excellent close-ups, but is not the plant illustrated as *Acacia juniperina* really *A. verticillata*? The appendix of derivations of plant names should be widely appreciated. It is surely original, though, to explain "Passiflora" as "spread-out flowers" and to claim James Backhouse as an Australian botanist.

In spite of these criticisms, the book contains a large amount of information and calls attention to several hundred species of Australian plants which merit cultivation.

J. SOUSTER

"Wild Flowers of the Ceylon Hills." By T. E. T. Bond. xviii + 240 pp Illus. (Geoffrey Cumberlege, Oxford University Press.) 1953. 17*s.* 6*d.*

Many visitors to Ceylon and residents in the hills must have been attracted by the wild flowers and longed for a book to tell them the names and something about the flowers. Mr. Bond's book with its illustrations by Mrs. Bond should be just what they need. The author steers a course between the scientific flora and a purely popular work. He follows the families of plants as given in Trimen's Flora, but gives also a key based on the colours of the flowers. The illustrations should be very helpful but would have been improved by the addition of enlarged drawings showing the structure of the flowers. Some of the discussions following the species are interesting as for example that relating to the periodical flowering of the "Nillu" and the hetero-styly of Hedyotis. Some Sinhalese names are given followed by the letter S in brackets, but I cannot find that this is anywhere explained, with Tamil sometimes T is occasionally used. Some explanation of these names would have been useful to those not familiar with the language. The story relating to the "Naga-maru-ala" refers to a plant with blotches (i.e. blood stains) on the leaves, probably *Scilla hyacinthinus*; not to *Ipsea*.

The book figures some very beautiful flowers, which are never or rarely seen in gardens probably because they are extremely difficult to cultivate. *Ipsea speciosa* (The Daffodil Orchid), *Impatiens acaulis* and *Exacum macranthum* are examples.

A. H. G. ALSTON

"Diseases and Pests on Horticultural Planting Material: A Guide to their recognition." H.M. Stationery Office. 6*s.* net.

A big title for such a small book but it is one which is likely to be of immense assistance to those government officials who, though not specialists in plant pests and diseases, still are expected to decide whether plants intended for export are free from infection. This in some cases depends on the detection of minute symptoms which might confuse an expert, and horticultural officers who have to carry out these inspections must often wish for a helping hand. This little book of less than 40 pages must surely meet the case because it lists in alphabetical order upwards of 400 pests and diseases of horticultural plants and gives a brief but adequate description of these troubles as they may occur on plant material in the dormant or semi-dormant state. The inspection of plants in this state as they are moved from country to country is of the highest importance and has been agreed upon by most civilized countries to help in preventing the spread of diseases and pests. The officers charged with the work will find this handbook of the greatest assistance in identifying the various troubles, the text indicates where to look and what to look for and there are no less than 83 photographs which, for the most part, are excellent. The book is easy to read and handy for the pocket and although one hopes that it will be amplified in time it will be welcomed not only by government inspectors but by many other people concerned in buying and selling plants.

D. E. GREEN

* *A Research on the Pines of Australia*, R. T. Baker and H. G. Smith, p. 89 (1910)

"The Villa Taranto. A Scotsman's Garden in Italy." By Neil McEacharn. Royal 8vo. 88 pp. Illus. (Country Life.) 25*s*.

A brief account of the gardens at the Villa Taranto on the shores of Lake Maggiore was given in the Society's JOURNAL for July 1953. Many fellows will be glad to have the fuller account as well as the many beautiful illustrations given in this book. Those, like the reviewer, who have been privileged to visit these gardens, can bear witness to the many notable and interesting plants to be found there, particularly among those genera such as Nelumbo and Gardenia which benefit by a good summer ripening. The visitor should particularly notice among the specimen plants the remarkable *Rosa Soulieana* illustrated, many fine Magnolias and Camellias, an unusually lovely grey-leafed *Eucalyptus coccifera* at the edge of the big lawn, the Wisterias tumbling over the pergola and many others which have now reached a majestic size and present spectacles of great beauty when in flower. The gardens are now reaching a state of maturity and so it is good to know that through Captain McEacharn's generosity their future is assured at the hands of the Italian Government. In this book the owner tells of their planning and construction, of their growth, of the difficult war years when they were maintained and safeguarded through the efforts of Dr. Cappelletto, the administrator of his Italian property, and then of the restoration after the war. There are special chapters on the Rhododendrons and Magnolias, on the colours of spring and summer and on the beauties of autumn and winter. It is an interesting story, heartening in these days of high labour costs and difficulties of construction and maintenance in so many gardens and Captain McEacharn can well be proud of the results obtained in, for gardening, a comparatively short span of time. He only bought the property in 1930. The book closes with a most unusual list of plants of special interest which gives evidence of the extremely wide variety of the author's interests in the plant world. I expect that many more will be tempted by this book to visit the gardens at the Villa Taranto. They are open every day.

PATRICK M. SYNGE

"A Garden of Bellflowers." By L. H. Bailey. 155 pp. Illus. (The MacMillan Company.) $5.00.

" One reason why I have been attracted to the Bellflowers is because they are not hopelessly confused by hybridisation." Thus, Dr. Bailey, in his introduction—a view which will be shared by many, as shown by the modern trend away from the enormous Dahlias, Chrysanthemums and even Roses which were the height of ambition of growers thirty or forty years ago. A little later he gives as another reason: "I have had no particular trouble with insects and diseases on them," which brings them into the category of plants which everyone wants to grow. And with the desire to grow comes the desire to know and recognize the many species which this group of plants contains. Here then is the object which this book sets out to achieve, but with the deliberate restriction to species which have been cultivated in North America. The restriction, however, means that growers in this country will miss many species with which they are familiar, particularly among the Grecian species which probably do not take kindly to the more extreme climatic conditions which prevail in New York. Here is probably the explanation of a rather serious error which occurs under *C. tubulosa*, where *C. carpatha* from Carpathos is referred to as *C. carpathia* from the Carpathian mountains. This species (or sub-species) is now in fairly general cultivation it this country thanks to the collections of Dr. Peter Davis, though its correct status is still a matter of dispute.

Particular interest attaches to Dr. Bailey's treatment of the *elatines-garganica* group where, after fully discussing the relationships, he recommends the adoption of a suggestion made by P. J. van Melle in 1940 to group them together as "Adria" Bellflowers (incidentally, Plate 10 appears to be wrongly named), all having their homes around the Adriatic.

Having given full descriptions of 131 species of Campanula (little over one-third of the genus), the author deals similarly with many of the closely allied genera (Adenophora, Codonopsis, Wahlenbergia, etc.) which can be brought within the broad term "Bellflowers." And this is, perhaps, the most valuable part of the book, for they are much less known and accurate descriptions are not readily accessible; yet very many of them are well worth the attention of gardeners.

Drawings of 50 species by Mrs. Elizabeth Burckmayer add much to the value of the book and show how much more useful this form of illustration is for identification purposes than the best of photographs, though the latter may give a better idea of the general habit of the plant as seen in Nature or in our gardens.

H. CLIFFORD CROOK

"The Potato—in health and disease." By T. Whitehead, T. P. McIntosh and W. M. Findlay. 744 pp. Illus. (Oliver & Boyd.) 60*s*.

The publication shows the importance of the Potato crop in Britain and the enhanced value of one of the main foodstuffs in which this country is practically self-supporting. The assembly of material is presented in an excellent manner, making it possible to study each feature independently, and is a vivid portrayal of the subject under discussion; it is well written so as to be clearly understood by any section of the community, whether they be gardeners, farmers, students or research workers.

The book tackles a great problem in a most interesting and practical manner, and reveals the authors' familiarity with the Potato, and they have also greatly extended the contents since their first edition published in 1927.

It should satisfy a wide range of readers, whose interests may lie in the economics of the crop; or those seeking information as to varietal characteristics and behaviour, including the more recently introduced varieties; or growers desiring guidance on the production of healthy seed and may also learn of the latest treatment of the crop with fungicides, and the best methods of management both in the field and store, with much useful information on many problems for either seed or ware growers.

The authors have freely presented up-to-date knowledge on diseases and pests, and also cover a wide range of factors, at present scattered throughout many scientific journals, which influence successful Potato growing.

N. MCDERMOTT

"Hardy Rhododendrons." By Frederick Street. 192 pp. Illus. (Collins.) 15*s*.

I like Frederick Street's new book on Hardy Rhododendrons, although it might more appropriately have been entitled Hardy Hybrid Rhododendrons. But I am not to be drawn into a species *versus* hybrid conflict, although almost he would persuade me. Anyone who wants to know something of the history of the hardy hybrid Rhododendron—and everyone should—and the story of the origin and the raising of many of the older-fashioned hybrids will find much of interest in this book. And there is much more in it—a selection of the best for those who want a few and a selected classified list of some two hundred of the more noteworthy, setting out in tabular form, colour, size of flower and truss, period of flowering and capacity to flower, hardiness, rate of growth, habit, constitution and the author's rating and personal remarks, often amusing and always worthy of note. Later chapters deal with planting, pests and propagation.

It is scarcely necessary to add that Mr. Street as a "dyed-in-the-wool nurseryman," as one of the "pseudo-gents" as he styles himself, who have replaced the former "giants of the Rhododendron world," has a vast experience in the raising of Rhododendrons. In his book he gives us freely from his great store of knowledge, and leaving aside the entertainment in the reading of it, at a cost of only fifteen shillings we have his most valuable and practical advice offered, not at the consultant's normal rate, but at a throw-away price.

J. M. COWAN

"The Encyclopaedia of Garden Work and Terms." By A. G. L. Hellyer. 288 pp. Illus. (W. H. & L. Collingridge, Ltd., London, 1954). 21*s*.

This attractive, handy-sized volume has been compiled by Mr. Hellyer to supplement Sanders' *Encyclopaedia of Gardening*, which it seems to do admirably. Not only does the author tell us in simple language how to perform all the tasks essential to the proper maintenance of a garden, but he also defines clearly an enormous number of technical terms used in horticulture today.

Many of the articles covering gardening operations are illustrated by photographs or drawings, and these should be most helpful to the beginner; and there is much besides of the greatest value to the experienced gardener, especially in the sections concerned with the control of pests and diseases.

We have no hesitation in recommending this work. The typography is excellent; and as in format and style of binding it matches both Sanders' *Encyclopaedia* and Mr. Hellyer's *Encyclopaedia of Plant Portraits*, the three together form a desirable set.

N. K. GOULD

"Tulip Forcing." By J. A. Cusdin. 87 pp. Illus. (Ernest Benn Ltd.) 6*s*.

This comprehensive little book does much to dispel the idea that Tulip forcing is intricate and difficult.

The author is to be commended for the excellent arrangement of the matter which

makes for quick and easy reference on any specific aspects of Tulip forcing. The advice given throughout in simple understandable language is excellent. Some twenty illustrations make the work attractive. The writer champions the cause of the home producer of bulbs which he rightly says are as good as imported ones for forcing. He gives, however, in an excellent set of appendices the procedure to be followed and forms to be completed when importing bulbs. Costings and returns also receive attention in this section. A little more space might have been given to new techniques in Tulip forcing and bulb preparation which aim at conservation of national fuel. The brief references to warming, cooling and handling such stocks are however sound.

This book should prove a most valuable addition to the bookshelf of any keen market gardener or other grower interested in bulb forcing.

H. W. ABBISS

"The Housing Estate Garden." By S. J. Poole. Cr. 8vo. 112 pp. Illus. (Collingridge). 7*s*.

This is a useful and practical little book which should prove very helpful to the many tenants of small houses who are beginning to cultivate a garden for the first time and also to those who wish to know how to maintain a good supply of vegetables and flowers from a small area. Mr. Poole boldly states that it is possible for the average small garden of about 250 square yards in area to provide a small family with all the vegetables it needs for nearly a year. If maincrop Potatoes be excluded this is probably true and is an excellent argument to support his view for planning small houses at 12 to the acre, rather than 18. After several concise but clearly explained general articles on soil fertility, digging, etc., Mr. Poole deals with individual vegetables and a few flowers. A particularly welcome innovation is a list of recommended vegetables divided into three categories, those best for table, for bulk, and for exhibition. The only weak section in the book is that on Shrubs, but in such a small area these must be selected with the greatest care and only the very best forms grown.

PATRICK M. SYNGE.

"The Beginner's Garden." By Peter R. S. Hunt. 92 pp. Illus. by line drawings. (W. H. & L. Collingridge Ltd.) 3*s*. 6*d*.

This book, number 8 in the series of Amateur Gardening Handbooks, is concisely summarized in its title. Mr. Hunt has presumed no previous knowledge on the part of his reader and explains in simple graphic terms the fundamental essentials for beginners. His prefatory chapter deals with tools which he takes in the order of priority, starting with the spade, the fork, the rake and the hoe. He goes on to the preparation of the soil, seed sowing, planting, feeding, propagation and a variety of subjects from the laying of paths, the making of screens and hedges and plant propagation. Line drawings illustrating the various operations add to the clarity and usefulness of this primer of gardening.

"Your First Garden." By G. R. Kingbourn. Demy 8vo. 180 pp. Illus. (Dobson Ltd.) 9*s*. 6*d*.

This is a discursive book designed for the interest and encouragement of boys and girls who have just become interested in plants and gardens. There is a good chapter on plant names which should help from the beginning, then chapters on plant collecting, propagation, gardens in other lands and English gardens followed by chapters on Bulbs, Annuals, Biennials, Hardy Herbaceous Perennials and Hardy Shrubs. There is little about fruit or vegetables so often the delight of the young gardener and also little about the main aspects of cultivation such as digging, but there are many unusual facts to be gleaned throughout the book and so it may prove interesting and stimulating to the young gardener.

PATRICK M. SYNGE

"Figs out of Doors." By Justin Brooke. The Countryman Library. 92 pp. Illus. (Rupert Hart-Davis.) 7*s*. 6*d*.

This little book is a welcome one for it fills a gap in the fruit section of our bookshelves and it should further the culture of figs in this country, both in private gardens and as a commercial crop. Many aspects of cultivation are covered including propagation, planting, feeding, pruning, spraying and watering, and there are informative chapters about the history and peculiar physiology. The importance of restricting growth of figs is emphasized with ways and means explained. The two final chapters are of particular usefulness. One gives a concise calendar of the year's work; the other, recipes for preserving, jam ,wine and bottling.

LANNING ROPER

"Vine Growing in England." By George Ordish. The Countryman Library. 128 pp. Illus. (Rupert Hart-Davis.) 7*s*. 6*d*.

There is a fascination about anything to do with vine growing, be it on the Continent or at home. For some reason the possibility of the latter has too long been overlooked although there is historical documentation and proof that at one time the trade flourished. Mr. Ordish describes the growing of vines, concisely but adequately dealing with the various aspects of planting, pruning, manuring, spraying, harvesting, etc. He wisely prefaces his chapter on making wine with a fascinating one on what wine is. His approach is scientific but so well presented that it is easily followed by the layman. It is my hope that this book will have many readers and that they in turn will carry out the practices, thereby furthering the wine industry in England.

LANNING ROPER

"Labour-saving Planning and Planting." (The Studio Gardening Annual, Vol. 5.) 144 pp. Illus. (The Studio Publications.) 18*s*.

The theme of this volume is labour-saving in the garden and the three articles on labour-saving flowering trees and shrubs by Frederick Street, shrubs for ground cover by A. T. Johnson and the economy of the Rose by N. P. Harvey are well written, constructive and informative substantiation of this theme. Each is followed by a list of plants giving colour, time of flowering and ultimate height, which is so important to the inexperienced planter. Mr. Street has included two other items of particular merit, the type of soil required and suitability of the plant for town, country and seaside gardens.

The chapter on hedges by H. J. Beddall contains both practical advice for cultivation and attractive suggestions for the infinite variety of hedging plants which confront the gardener. The inclusion of this topic seems a bit out of keeping with the labour-saving theme, for the clipping of hedges is one of the major labour items which many people are attempting to eliminate.

Mr. A. D. B. Wood has written a delightful chapter on screens, arbours and garden houses, giving historical background and some original suggestions. Mr. S. G. Boakes has dealt with garden surfaces and paving so clearly that the amateur can lay his own terrace or crazy paving.

The illustrations are numerous and attractive but it seems pointless to include plants like *Lapageria rosea* and *Telopea truncata*, both of which are difficult plants except under very specialized conditions. There is an unfortunate tendency today in some of the more popular publications to include photographs of plants for their attractiveness rather than their suitability for the text.

LANNING ROPER

"Successful Orchid Culture." By P. R. C. Rittershausen. 136 pp. Illus. (W. H. & L. Collingridge Ltd.) 15*s*.

Reading the first four chapters of this presentable little guide, I am constantly reminded of the late Mr. E. Cooper, who, in the '30's, took me to visit Mr. Rittershausen, then starting his collection of Orchids in Balham. His enthusiasm was unbounded, and success considerable. Mr. Rittershausen's qualifications for helping the amateur with but a small house are undoubted. This book takes the usual pattern of Guides to Orchid Growing (there are some twelve modern works), and consists of 110 easily read pages of matter and 24 photographs. I can, however, not agree with *all* he writes, although the first chapters contain excellent notes. A middle stage, for example, can never be satisfactory in the small houses his book caters for, and accepting *his* measurements for a house 12 feet long, the middle stage *could* be but 4 feet long! (The loss of staging compared with a normal two sides stage of 3 feet 9 inches would be 30$\frac{3}{4}$ sq. ft.) Many cool-house Orchids *do*, in fact, usually grow *better* under intermediate house conditions, e.g. *Vanda coerulea*, Miltonias, Dendrobiums and many others. The manner of holding the watering can suggested opposite page 16 would reduce the possibility of correctly watering beyond the third plant to nil, and seed pans should *never* be watered overhead. The knife seen splitting a five-bulbed Cymbidium clearly suggests splitting three back bulbs from two leading ones, which would be disastrous to most amateurs, four/five bulbs being the accepted safe minimum. Other pictures are mostly good, though the varietal form of *Oncidium varicosum* is most certainly not 'Rogersii.'

I feel that to include under "Intermediate" house with a minimum of 55° F. (his

figure) such positively *stove* plants as *Vanda Sanderiana*, *Cypripedium niveum*, *Oncidium Cavendishianum*, *Coelogyne pandurata* (from Borneo!) etc., is positively misleading!

Species (page 49) *are* I feel just the types needed by amateurs with small houses, for they have more individual character than hybrids.

What I deprecate most about this otherwise excellent book is the recommendation of specific *hybrids*, so quickly obsolete in most cases. The ten Cattleyas listed form together precisely ·0038 per cent. of the known hybrids!

DAVID F. SANDER

"Conway's Treasury of Flower Arrangements." By J. Gregory Conway Illus. in colour. 337 pp. (Routledge and Kegan Paul.) £4 4*s*. 0*d*.

This author has given us a volume that all persons who are interested in this subject should do their best to possess and to examine thoroughly as it will fill them with new ideas and improve their tastes. He tells us that he has explored the oriental as well as the occidental ways and this book is certainly a case of East meets West with very satisfactory results. The numerous illustrations are excellently photographed and only one of them calls for adverse criticism. It is on page 116 where some daffodils have been put lying horizontally—a position no one who knows these lovely upright growing flowers will like to see. The coloured pictures are quite enchanting though with somewhat fanciful backgrounds which, however, much beautify them.

On page 35 the author alludes to "Green Grey Artichokes" and they are shown a deep red! In Europe and in the southern States of the U.S.A. (where they are grown in great quantities for the northern markets) they are never red and only, if left to be in full bloom, do they have some violet colour like enlarged thistles. Maybe these red ones have been dyed to enhance the picture ? Be that as it may this is a very good book and should raise the standard of good taste wherever it is studied.

FRANK GALSWORTHY

" Hedgerow and Park Timber and Woods under five acres 1951." Forestry Commission Census Report No. 2. (H.M.S.O. 1953.) 5*s*.

This publication, following the census of woodlands of five acres and over, completes the survey of all timber resources of Great Britain begun in 1947.

This book is of interest chiefly to those intimately connected with forestry. In it is given elaborate statistical details of Hedgerow and Park Timber, Woods of One to Five Acres, 'Unproductive' Woodlands, Distribution of Small Woods by Counties, and the Composition and Classification of Small Woods. In addition, a summary of both surveys gives the volume of all trees and woods in England, Wales, Scotland, and in Great Britain as a whole, together with details of the sampling techniques on which the figures are based.

From these facts it is interesting to note the relative predominance of coniferous trees in Welsh hedgerows and parks accounting for 12 per cent. of the volume as compared with half this amount for England. The Larch is particularly frequent having 4 per cent. as against 0·5 per cent. of the volume in England. On the other hand, Elm is less important in Wales with only 13 per cent. of the volume whereas in England the figure amounts to 21 per cent. The Oak is equally important in both countries with 31 per cent. of the total volume. In Scotland it is surprising to learn that here the one indigenous Pine, *Pinus sylvestris*, contributes but 9 per cent. of the total hedgerow and park timber.

ROBERT ADAMS

"Garden Pinks and their Culture." 32 pp. Illus. 2*s*. 6*d*. "How to Grow Perpetual-Flowering Carnations." 48 pp. Illus. 5*s*. (The British National Carnation Society, 33 John Street, Theobalds Road, London, W.C. 1.)

These two booklets, published with all the authority of the British National Carnation Society, should prove very helpful to growers of garden Pinks and perpetual-flowering Carnations. That on Pinks contains articles on Dianthus species by T. B. Ellis, on Cultivation and on Pinks in the Garden by F. R. McQuown and on Dianthus Gardens by M. C. Allwood, this last with some delightful plans of Dianthus gardens designed by Edward White. There is also a short section on Exhibiting. The booklet on Perpetual-flowering Carnations is a reprint of articles from *Carnation Year Books* and this is its fifth edition, suitably revised. It aims at covering all that the amateur grower of these flowers is likely to want to know from composts to propagation and even classification.

PATRICK M. SYNGE

"Britain's Forest." Glentress, 1*s.* Drumtochty, 1*s.* 3*d.* Illus. Forestry Commission. H.M.S.O.

These two little guides to forests in Scotland continue the high standard of photography and presentation that we have now come to associate with this series. Glentress forest is in the Valley of the Tweed and includes some of the oldest forests owned and managed by the Forestry Commission in Scotland. An unusual stand of 20-year old naturally regenerated Sycamore shows how attractive this tree can be when grown in such a way, while stands of Douglas Fir and Sitka Spruce 81 feet high and 49 years old show the majestic aspect that can be obtained by these Conifers in one generation. Drumtochty forest is on the south side of the Grampians and is mostly on hill land, hitherto unproductive and in consequence the plantings consist chiefly of Conifers but the deciduous Larch serves to break up the large expanse of dark green of the Spruces and Pines. Test plots have been planted here up to just over 1,500 feet and in this cold area *Pinus mugo* and *P. contorta* have been used to form the initial shelter in which the Sitka Spruce can be later interplanted. The guide also deals with the wild flowers and the birds and here grows the charming little *Linnea borealis* as well as several terrestrial Orchids while occasionally a golden eagle may be seen.

PATRICK M. SYNGE

"Flower Arrangements Judged and Points Scored." By Marie Stevens Wood. Demy 8vo. Illus. 166 pp. (Merriewoode Press, 240 Second Street, Macon, Georgia, U.S.A.). $3.50.

In this country as well as in America there is a great and ever increasing interest in floral arrangements and many after walking round the shows must have wondered how such very diverse exhibits can be judged. How appropriate is the quotation from Dante with which the book starts "O mortal men, be wary how ye judge." The book contains a short introduction on the judging of flower arrangements followed by 32 plates of arrangements by the author each plate being criticised and given points by a guest critic according to the following scale, Design 25, Container interest and effectiveness 20, Relation and suitability of materials 20, Balance and proportion 20, Colour 10 and Condition 5. This is followed by a number of illustrations of arrangements by other members of the Flower Arrangers Club of Georgia and two really very beautiful plates of Japanese Flower Arrangements by Houn Ohara. Designers in this country will envy the lavish use of such material as Nelumbo. The book should prove of interest and assistance to many exhibitors of floral arrangements.

PATRICK M. SYNGE

"Vegetable Growing." By C. E. Pearson. 192 pp. Illus. (Ward, Lock & Co. Ltd.) 15*s.*

For those who are looking for a useful and readable book on vegetables Mr. Pearson has written one to be recommended. Its scope is wide for it contains much of the preliminary information that is required for the new gardener on tools, construction of walls, fences, paths, drainage and all the other preliminaries which must be attended to before the actual garden can be made. The chapters are short and well written. The material is practical. In the chapter on soils, for example, he suggests various obvious ways to judge the fertility and composition of the soil other than by a chemical analysis. For each vegetable there is an excellent section giving cultural directions, methods for storage, use, etc. The diagrams and photographs are good and have a freshness about them. Particularly helpful are the chapters and illustrations devoted to vegetable pests and their control.

"Town Gardening." By Robert Pearson. 178 pp. Illus. (MacGibbon & Kee.) 12*s.* 6*d.*

Mr. Pearson's book on this very popular subject deserves attention. The chapters on soil and lawns and their maintenance are particularly helpful as are the pointers which he gives on planting and on the legal aspects of town gardening. Over thirty-five pages of lists of plants are included, with brief descriptions and guidance for planting. The weakness of these lists is that some of the plants mentioned are difficult subjects and certainly would not take kindly to city or large town gardens where conditions are adverse. There is too little guidance on what to select from the wealth of suggestion. The illustrations include views of gardens as well as attractive plant portraits.

LANNING ROPER

"Flowers in Town." By Joan Cowderoy. 96 pp. Illus. (Newman Neame, London.) 9*s*. 6*d*.

This simply written book ably presents the solutions to many of the problems which confront the town gardener. There is information on choice of site, preparation of the soil, drainage, selection of plants, planting, pruning and other problems of a garden as well as chapters on indoor plants and bulbs in the house. The glossary included at the end will be of interest to the beginner and will serve as a ready reference. The illustrations have been carefully chosen to show possibilities of town gardens under varying limiting conditions.

LANNING ROPER

The following books have been received:

"In situ methods of Measuring Soil Moisture Content—A critical résumé" By B. A. Eastwell, B.Sc. (The British Electrical and Allied Industries Research Association.) 19 pp. 15*s*. 0*d*.

"Le jardin Familial." By P. Chouard. 223 pp. Illus. (La Maison Rustique.) 240 French francs.

"The Year's Vegetables." By H. C. Davidson. 46 pp. (Frederick Warne & Co. Ltd.) 1*s*. 6*d*.

"Dispersal in Fungi." By C. T. Ingold. 197 + vii pp. Illus. (Oxford University Press.) 18*s*.

"The Growing Year." By Clifton Lisle. 265 pp. (Farrar, Straus and Young, Inc., 101 Fifth Avenue, New York 3, N.Y.) $3.50.

"Census of Woodlands 1947–49. Woods of Five Acres and over. English County Details." Forestry Commission Census Report No. 5. 270 pp. (Her Majesty's Stationery Office.) 12*s*. 6*d*.

"Soils and Fertilizers." By Firman E. Bear. 4th edn. 420 pp. Illus. (Chapman & Hall.) 48*s*.

"Lawn Grasses. A guide to their identification and various uses." By F. J. Reed, F.L.S. 27 pp. (Ryders', Lawn Grass Seed Specialists, St. Albans.)

Forestry Commission—Forest Record. (Her Majesty's Stationery Office.)

No. 22. Shelterbelts for Welsh Hill Farms. 2*s*. 0*d*.
,, 23. Fires in State Forests in the years 1929–1952. 1*s*. 6*d*
,, 24. Revised Yield Tables for Conifers in Great Britain. 1*s*. 3*d*.
,, 25. Japanese Larches at Dunkeld, Perthshire. 2*s*. 0*d*.

"The Place of Botany in the life of a University." By C. D. Darlington. 23 pp. (Geoffrey Cumberlege, Oxford University Press.) 2*s*. 6*d*.

"The Proceedings of the Second International Conference on Scientific Aspects of Mushroom Growing." 183 pp. (Mushroom Growers' Association, Yaxley, Peterborough.) 12*s*. 0*d*.

ORDERS FOR BOOKS

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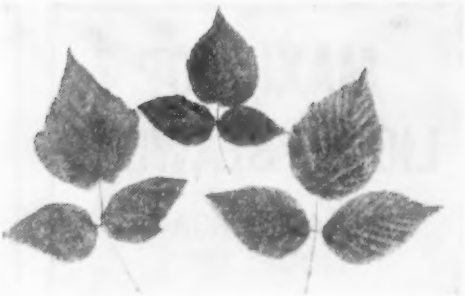

Manganese deficiency in raspberry.

Courtesy of Dr. C. G. Woodbridge (Summerland, B.C.) and the Department of Agriculture, Ottawa.

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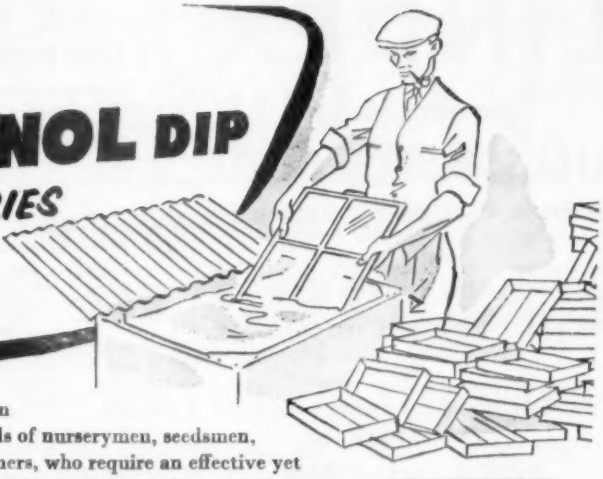

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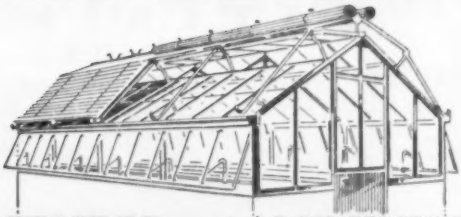

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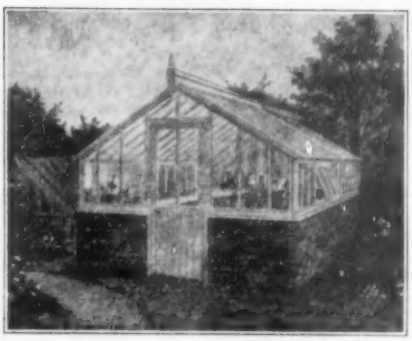

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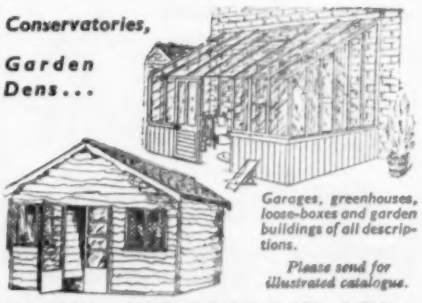

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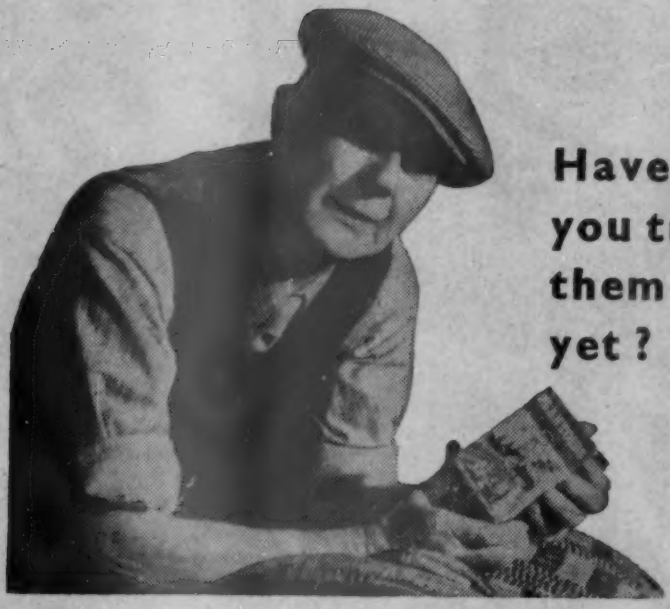

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